ENGINEERING NEWS-RECORD

Virginia forges Capital Beltway links p.26

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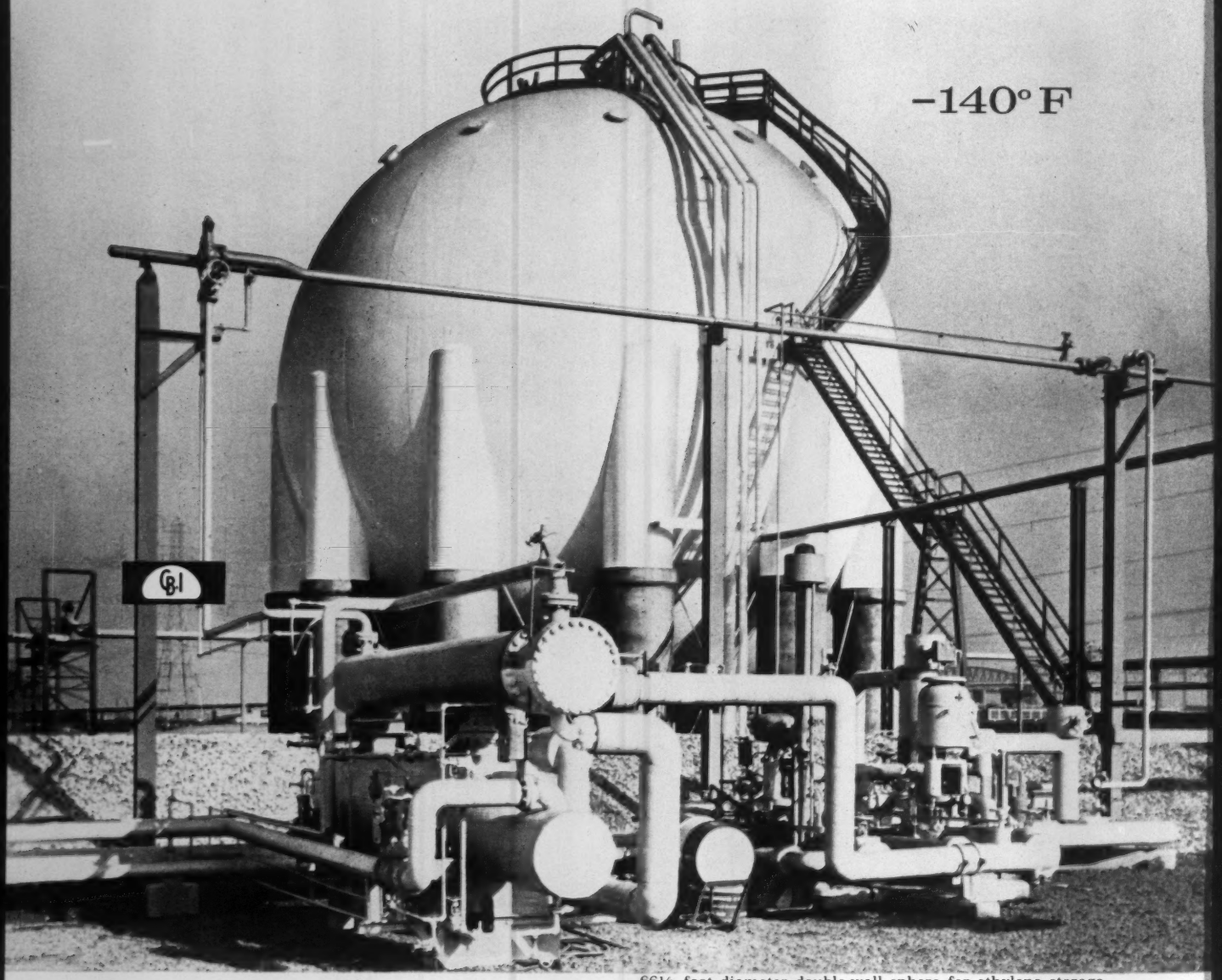

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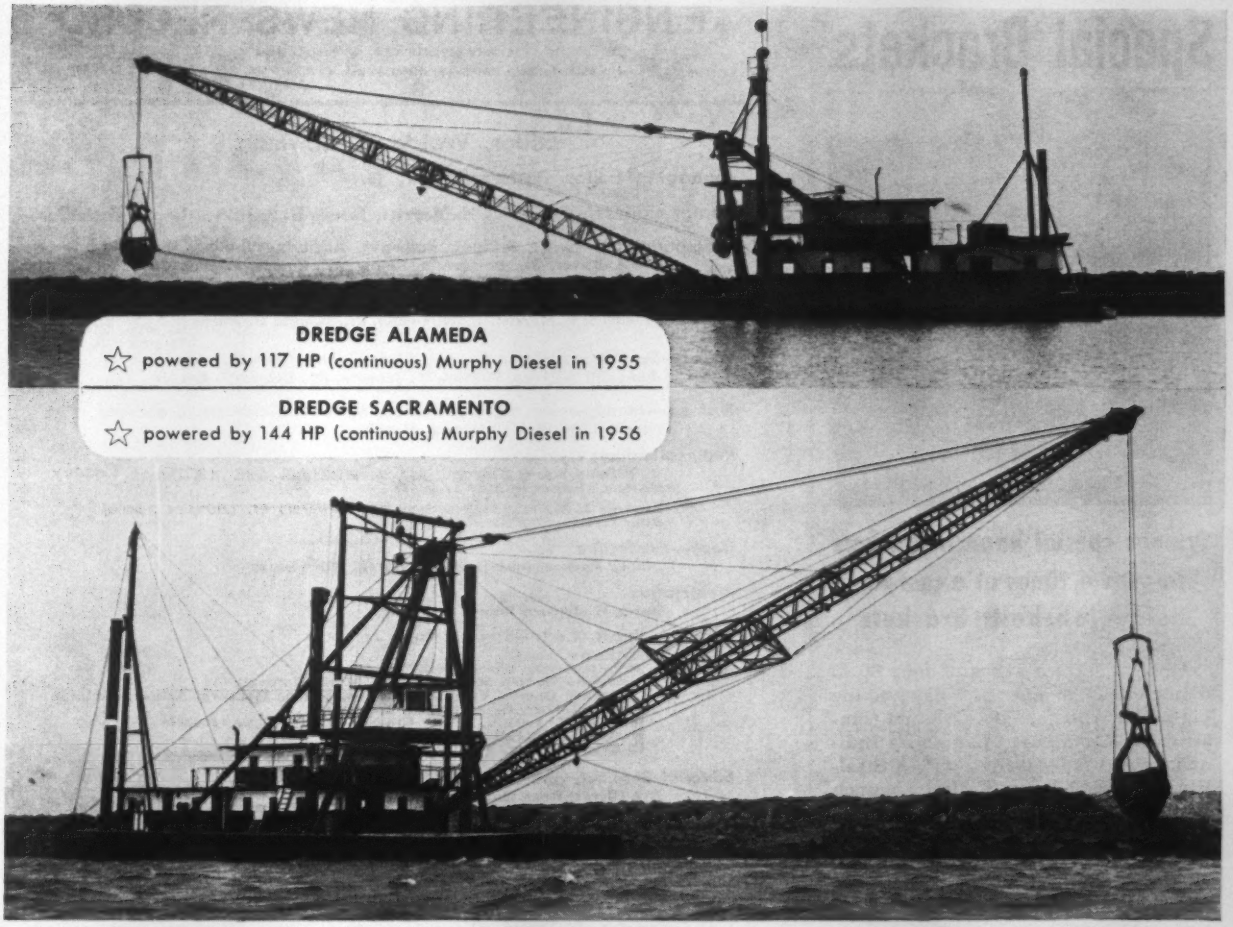

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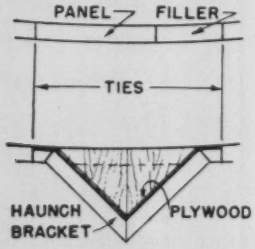

Plan view of special haunch brackets used horizontally on first lift.

were modified to comply with the job requirements. Result: 22 brackets were re-used four times at a price far below what it would have cost to job-build each bracket.

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And it's versatile. DFPA engineers have developed building plans for spans of 32', 40' and 52'. Several hundred variations in the basic design can be engineered from research information available from DFPA. Variations include different leg heights, spans, frame spacing, roof loads and wall treatments.

The rigid frame design originated from research efforts to develop a low-cost farm building. But the long clear span makes it extremely logical for warehouses, garages, commercial and public buildings, and even residential construction. For more information on the rigid frame system, or for construction plans, write (USA only):

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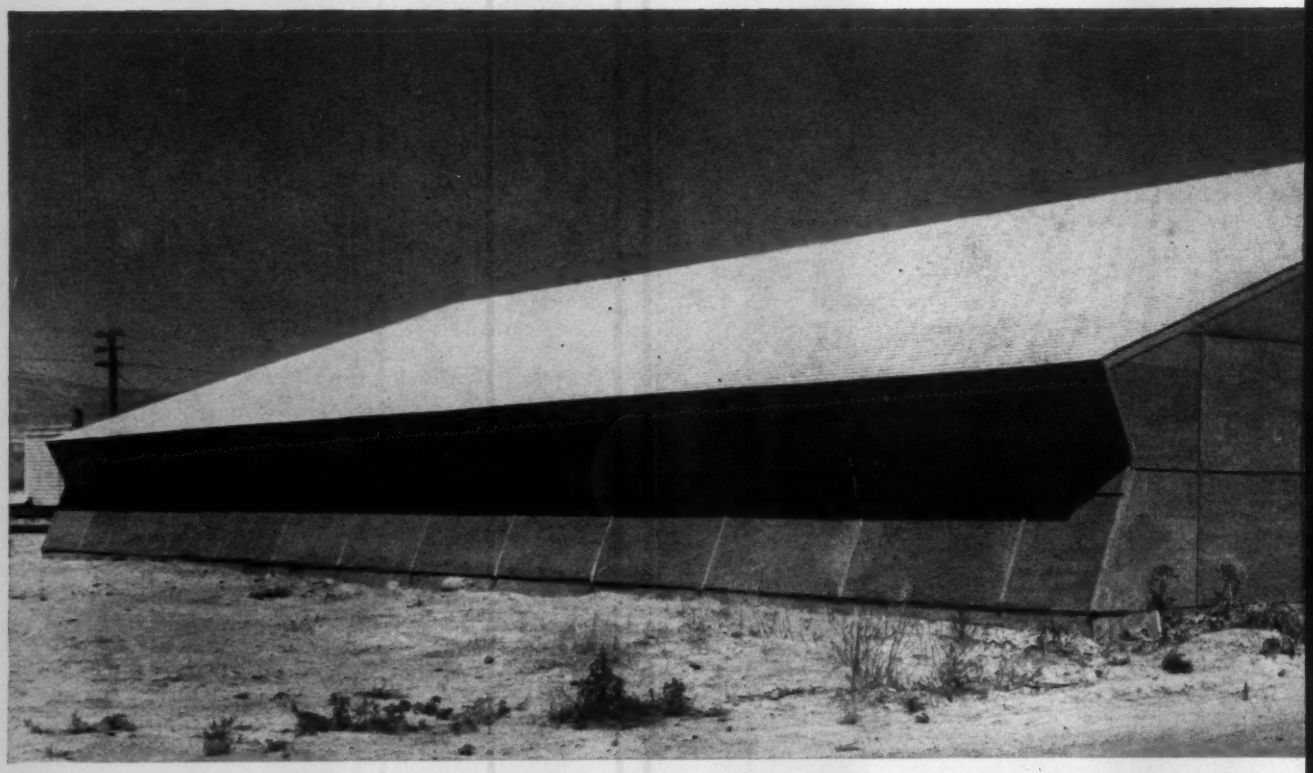
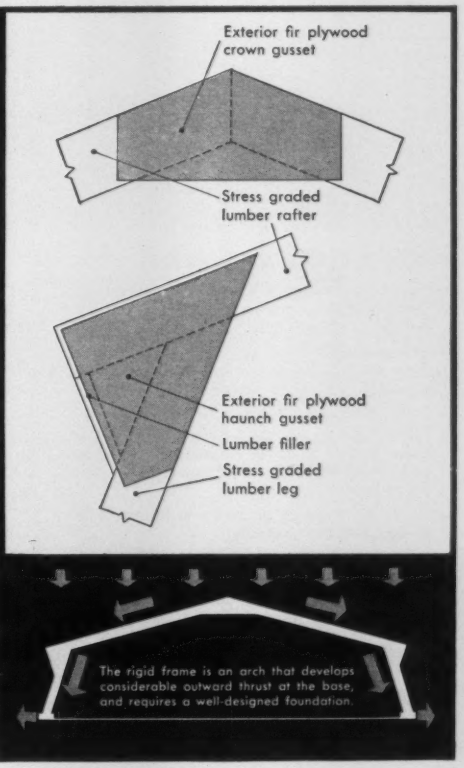


a simple construction system less than $1 per sq. ft.

The rigid frame farm building below, 40 x 225', was built in Western Washington for under $1 per sq. ft. Frames, which were built in a jig on the site, are 2 x 10's with gussets of ⅜" Exterior C-C plywood. Siding and roof sheathing are also Exterior plywood. Openings were left in siding to admit light and air.

On this rigid frame warehouse, Exterior plywood siding was unpainted and asphalt shingles went over the plywood roof sheathing. In some applications, sides may be straight instead of sloping in. To design these and other variations, refer to DFPA's basic design data on the rigid frame.


Exterior fir plywood crown gusset
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The rigid frame is an arch that develops considerable outward thrust at the base, and requires a well-designed foundation.

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Reader Comment

The View from Phoenix's Head

SIR—Your news story and editorial on the City of Phoenix and the housing code problem (ENR June 29, p. 19 and 60), contain many inaccuracies.

Your news story indicates that President Kennedy requested a step-up of urban renewal projects and that my reply was that we intended to handle our own slum clearance, whereas the President's telegram was primarily on the subject of unemployment. The telegram I received was the identical telegram the President sent to some 300 mayors of large cities urging action to reduce unemployment. The gist of his request was—reduce unemployment by going ahead with urban renewal.

We realize that there are slum areas in our city which require redevelopment, and we will provide the necessary leadership to accomplish such redevelopment without federal assistance. We do not feel that we must rely on the federal government for the solution of a local problem which local government is capable of solving. Our community has taken the initiative to proceed with capital improvement projects totaling $173 million over a 10-year period. The $173 million is in addition to approximately $45 million for public school facilities. Where can Engineering News-Record find an equal to this remarkable achievement anywhere in the United States?

Now for the housing code situation. In December of 1960, the Phoenix City Council had up for consideration an ordinance that would have modified the inspection provision of the Housing Code. To our surprise, we were met by a militant group of religious fundamentalists and two fundamentalist preachers who declared that they were not interested in amendments to the housing code. They declared the code to be unconstitutional, depriving them of their lawful and constitutional property rights, and they demanded its repeal by the City Council. The Council, of course, was not inclined to repeal the housing code because it was obviously a necessary part of local municipal government and was necessary for the protection of the health and safety of the community. The group thereupon set about to have the housing code repealed by circulating petitions demanding its repeal. When served with the petitions, the City Council decided to make a strategic retreat and repeal the housing code in view of a proposed $103-million bond issue, which was subsequently approved on May 23, 1961. We simply felt that any controversy over the housing code should not be allowed to interfere with the bond issue.

The City Council has announced its intention to appoint a citizens' committee to study a new housing code. We will select the City's leading citizens from all walks of life and from various organization groups. Based upon past experience, all who are asked to serve will serve, because in Phoenix it is considered an honor to be asked to serve the community.

We expect opposition from the same forces who demanded repeal of the old housing code, including the slum landlords who eagerly take unreasonably and unconscionably high profits out of their slum properties. We believe in free enterprise, but we also realize that the future of free enterprise depends on how well we understand it and the extent to which we follow the rules of economics inherent in the free enterprise system.

There was a reference in your editorial to a rejection of federal public housing. This is incorrect because we do have a City of Phoenix Housing Authority which is a part of the federal low-rent public housing program. It is operated very successfully and includes some 1,444 units, with an additional 114 units under construction.

The last paragraph of your editorial is so inaccurate that it is almost comical. Phoenix is one of the finest cities in the United States. Twice since 1950, it has been awarded the All-America Award which is a coveted honor sought by hundreds of cities each year. Responsible citizens were aroused in 1948, when they joined together to give non-partisan government to the city. This reform movement is now in its twelfth year. The present City Council was elected by a margin of 2½-1 at the last election. The recent bond issue of $103 million, which won voter approval on eleven separate issues, came only four years after a $70 million bond issue was approved in 1957. We are doing things in Phoenix. New industry is beating a path to this Western desert oasis city, which is fast becoming a thriving metropolis where the pioneering spirit of the early settlers still exists. The good people of Phoenix take pride in building a city destined to be a shining example to our nation and the world.

Last year we ranked eighth in the country in the number of new houses built, though we are only the 29th largest city in the United States, having moved from 98th to 29th between 1950

(*Reader Comment continued p. 10*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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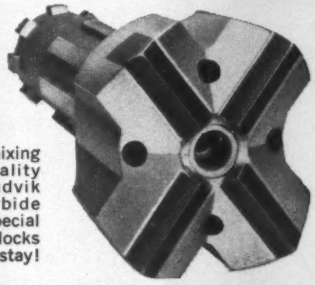

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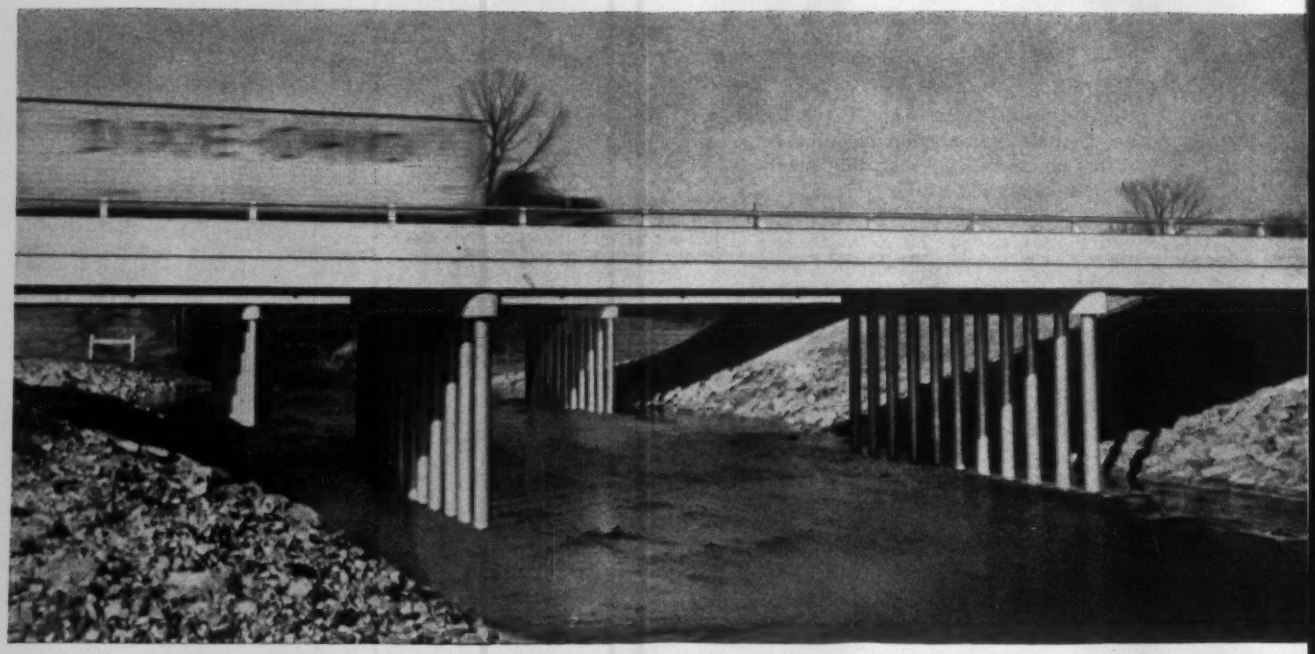

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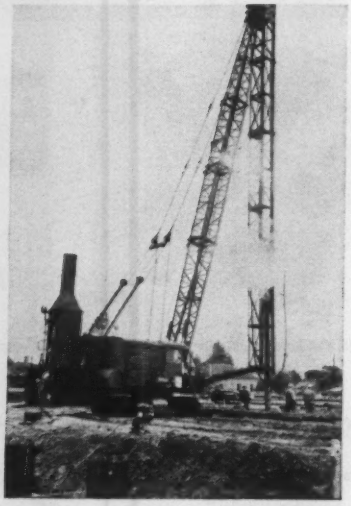
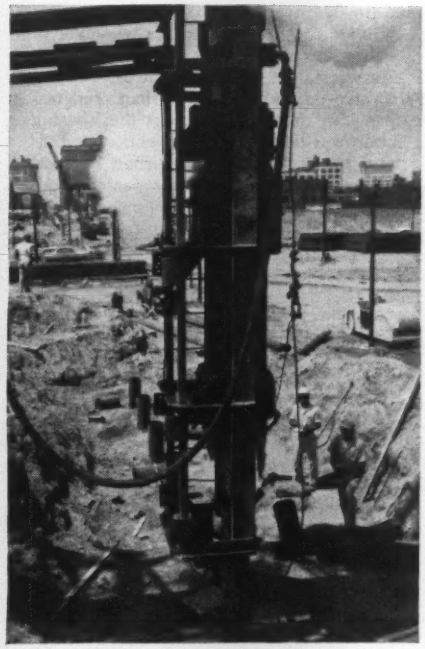


4.

1. Twin bridges on exposed Armco Pile bents carry Interstate 71 over Clear Fork Creek in Ohio.
2. Armco Piling is driven for foundation of bridge abutment on Cleveland Innerbelt — part of Interstate 90 in Ohio.
3. Here are 60-foot lengths of Armco Piling at site of foundation for approach work of new Woodrow Wilson Bridge at Alexandria, Virginia. Interstate 495.
4. Interstate 10 construction at Lake Charles, Louisiana, features foundation of Armco HEL-COR® Pile Shells.
5. Bridge abutment on Interstate 5W in California will rest on Armco Pipe Piling foundation. Note batter piles.

and Pile Shell Get the Important Jobs **on the Interstate System**



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5.

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. . . Reader Comment

and 1960. New buildings in the downtown section are being built at a feverish pace. Within the past year, projects here have been completed totaling $14 million, and during the coming year this figure will be exceeded.

I am sure that if ENGINEERING NEWS-RECORD would objectively study and survey the subject matter of the June 29 issue mentioned earlier, a different editorial and news story would result.

SAMUEL MARDIAN, JR.
Mayor
Phoenix, Ariz.

Editor's note: Mayor Mardian has pointed out no inaccuracies whatever in either our news story or our editorial. As we stated, the President did request a step-up in Federal urban renewal projects; the protest against the housing code was tied in with a rejection of federal public housing and urban renewal programs; the code was repealed; and, at the time, there was no prospect for Phoenix to get a housing code in the foreseeable future.

The last paragraph in the editorial, which Mayor Mardian found "almost comical," contained this statement: "With 14% of its dwelling rated as 'deteriorating' or 'dilapidated' in the 1960 Census and its rapidly growing population now over four times the 1950 count, Phoenix faces greater future problems; it could easily repeat the tragic experience of many American cities now paying the high price of procrastination."

This warning is underscored by forecasts of the Phoenix Growth Committee, which predicts a 700,000 population for Phoenix in 1970, and 1 million by 1980. The 14% substandard housing in Phoenix compares unfavorably with many other Western cities (e.g., San Diego, 8½%; San Jose 9%; San Francisco, 10%; Albuquerque, 11½%; Tuscon, 12%). Even an old Eastern city like Philadelphia, with its incomparably greater housing problem resulting from prolonged decay in the past, has reduced the number of its substandard dwelling units to 13%. And Philadelphia's planners are far from complacent about their city's housing problems.

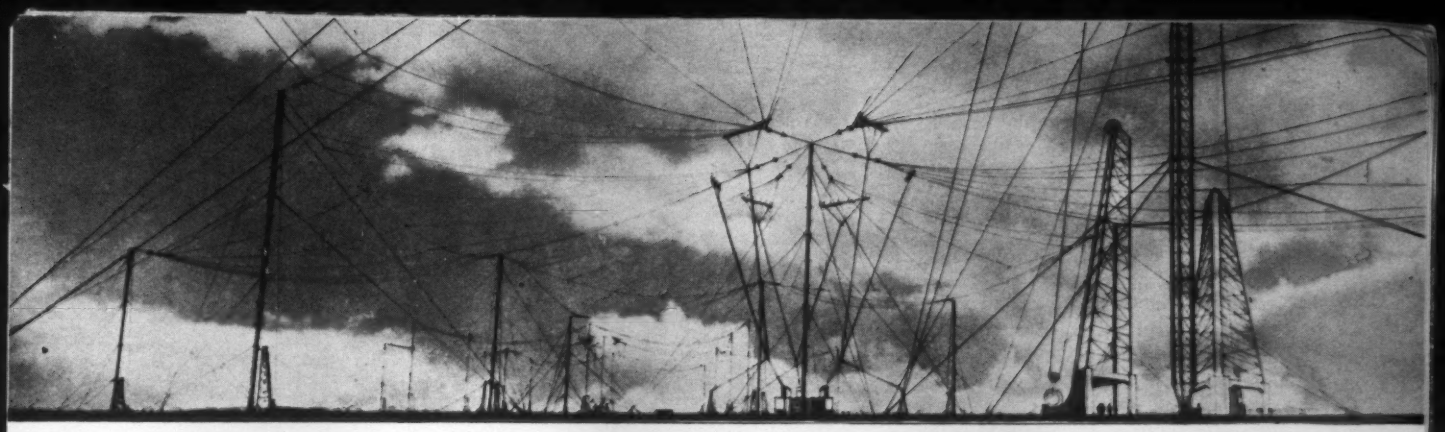
We are glad that something finally aroused the Phoenix City Council enough to consider appointing a citizens' committee to study a housing code and that Mayor Mardian—who as owner of the Mardian Construction Corp. should recognize the need for a housing code—does see this need.

Attitude is Everything

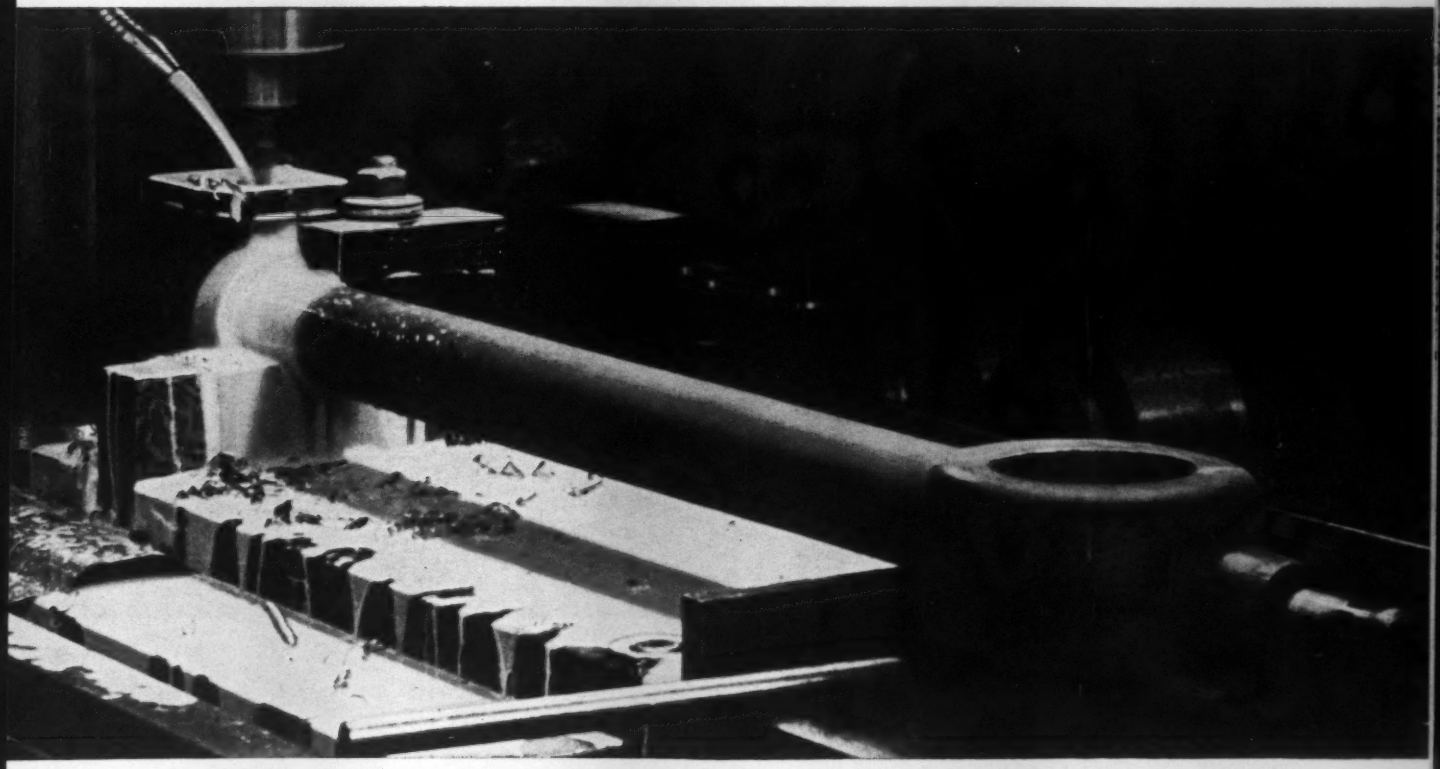
SIR—Your article Why I Quit Working for the Government, by C. R. Van Orman (ENR July 27, p.28) deserves an orchid.

What a difference this would make in federal employees if they could adjust themselves to thinking: "This is our work."

FRED HUNT
Leeds, Ala.



World's largest radio antenna contains 800 special Bethlehem eye-bolts



Husky eye-bolts, 800 of them weighing 75 lb each, are insulator-chain links guying the antenna of the most powerful radio station ever built. This specially engineered eye-bolt is typical of the special fasteners which Bethlehem manufactures in a wide variety.

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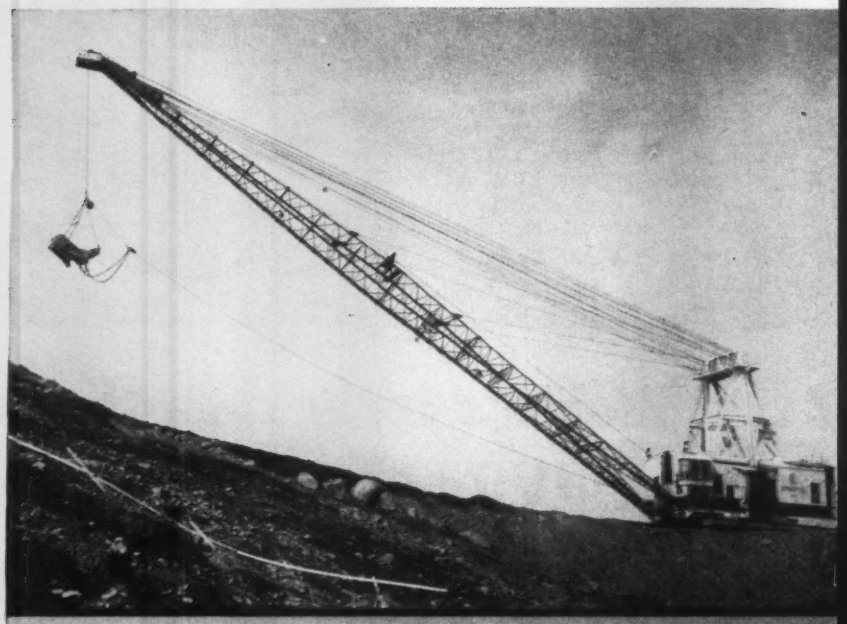
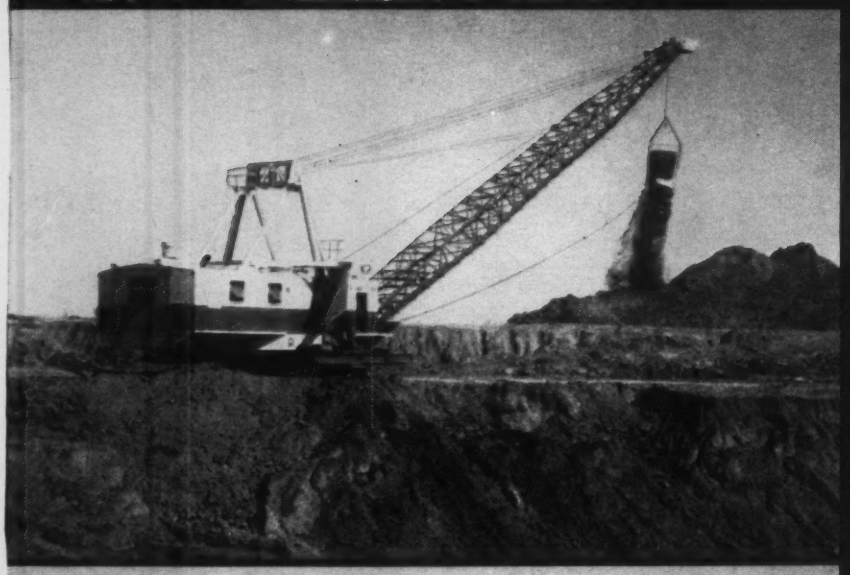
KEMI RIVER HYDROELECTRIC PROJECT IN FINLAND

Near the Arctic Circle, one of two Marion 7400's is now digging the outlet channel which regulates the lake. Some 6 million cubic meters (7,848,000 cubic yards) of earth and rock will be removed when the channel is completed in 1963. The Marion has been working since September, 1958, averaging 80,000 cubic meters a month (104,640 cubic yards). The work is being performed both under water and on the surface behind temporary dams.



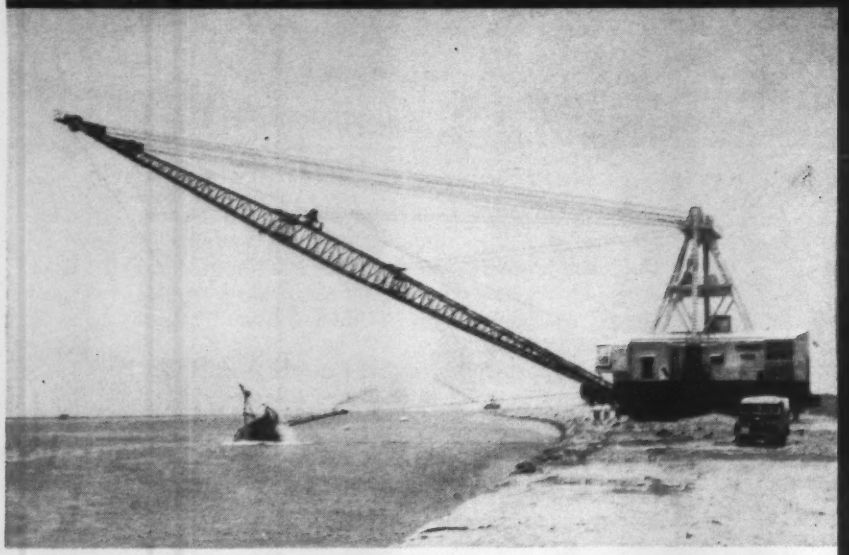
CHAMBAL RIVER POWER AND IRRIGATION PROJECT IN INDIA

The multi-purpose Chambal project consists of a dam, power station and 352 miles of irrigation canals. Working on opposite banks to help speed canal construction were two Marion 7200's. The two Marions excavated an average of 700 cubic yards of earth an hour. On completion of the canals in 1960, the Marions were moved to a virgin saddle cut farther down the canal.



WIDENING THE SUEZ CANAL

Two Marion 7400's working on the same bank are widening the Suez Canal.



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In the last 20 years Marion Walking Draglines have gone to work on five continents, in 14 different countries, in two provinces of Canada, and in 21 states in the U.S.A. In the last three years alone, 25 Marion Walkers, including four of the largest in the world, have been shipped to places as widely separated as Finland, India and Brazil. And Marion is currently working on a "super-giant," a Walking Dragline with an 85-cubic yard bucket and a 275-foot boom.

Marion Walkers have proved their ability on big construction projects, in quarries and gravel plants, and in bauxite, gold and coal mines.

A total of 48 of these Marions have earned their keep on tough jobs outside the U.S.A., where ruggedness and reliability are particularly important because of the parts and service problems imposed by distance.

On their past record, and on their present performance, Marion Walking Draglines can be counted on to give you sustained production at low operating and maintenance costs. They prove it daily, as they literally walk to work all over the world!

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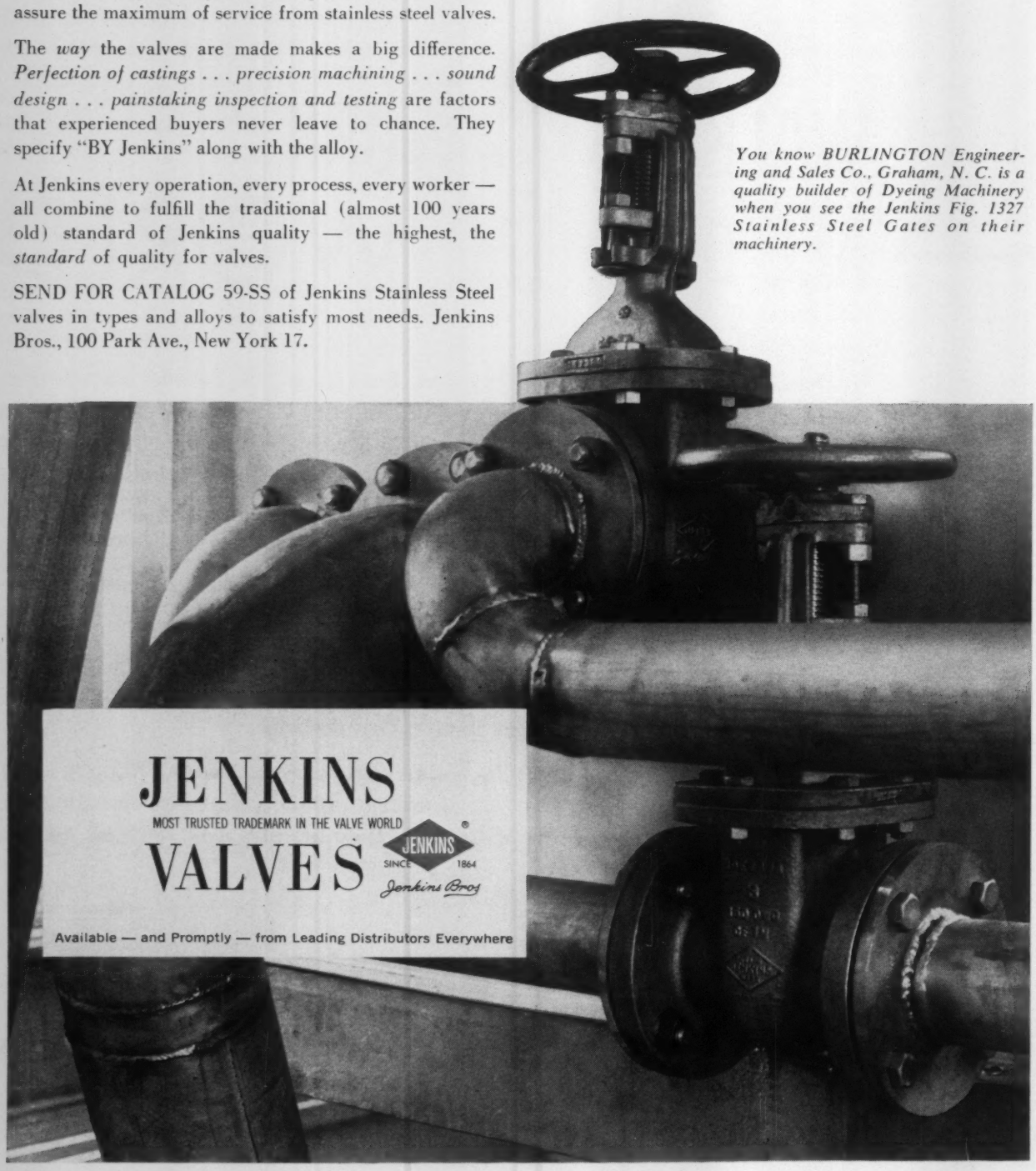

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THE CONSTRUCTION WEEK

WHO CAN BUILD A HIGHWAY?—Massachusetts' Gov. John A. Volpe must go to the state's supreme court to find out if the state or the Massachusetts Turnpike Authority can build a proposed 11.5-mile road from Weston into Boston. The state's attorney general has ruled that laws that set up the Authority bar the state from building the route. The Authority says it will try to sell its bonds for the turnpike extension sometime after Labor Day, the third try this year.

RR ABANDONS CAVED-IN TUNNEL—The Northwestern Pacific Railroad last week asked the Interstate Commerce Commission for permission to abandon a 1,363-ft freight tunnel in San Rafael, Calif., that partly collapsed last month after some of its wood lining burned (ENR July 27, p. 23). The tunnel isn't needed enough to justify the $1 million it would cost to repair it, the railroad says.

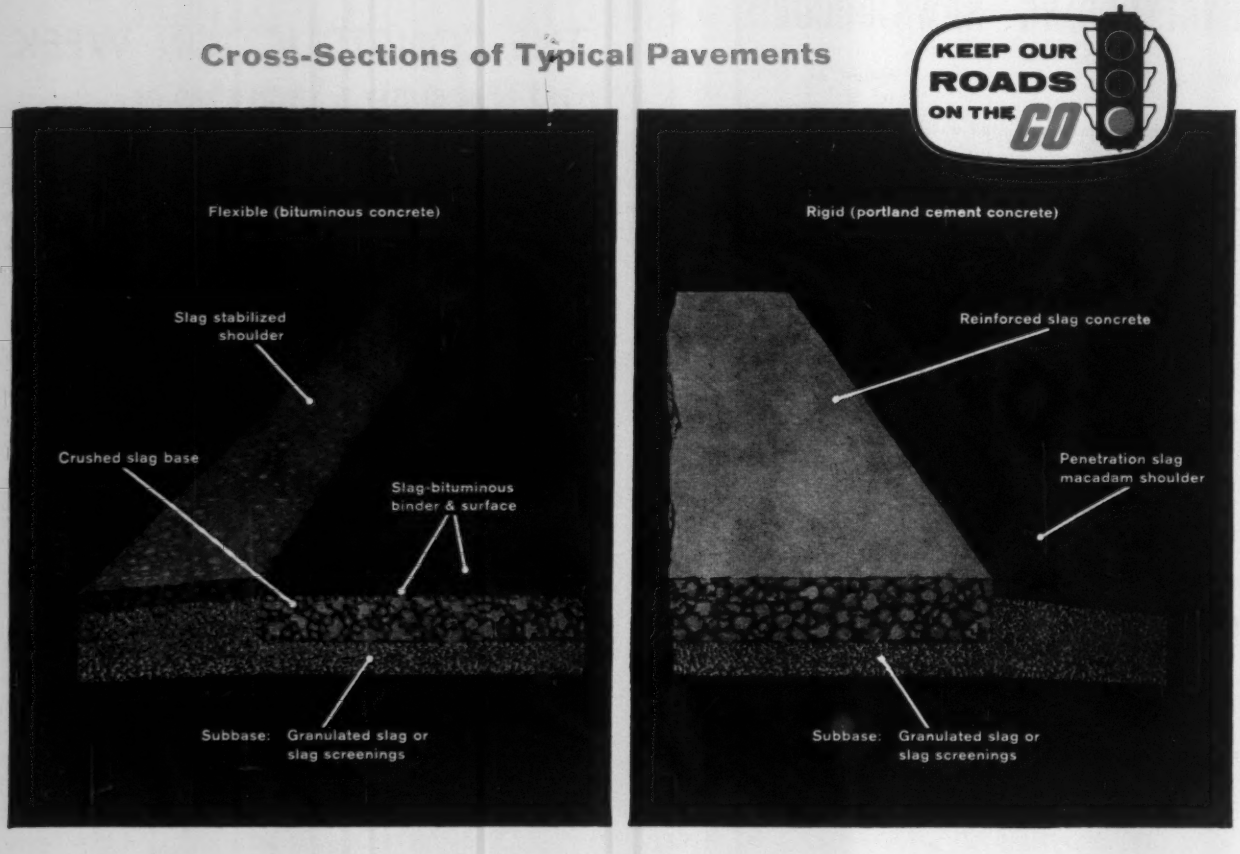
UNIONS BID FOR JOBS—The New Orleans Building and Construction Trades Council asks its affiliated unions to agree to waive travel time pay on missile site work as an inducement to the National Aeronautics and Space Administration to select the Michoud plant in New Orleans as the site for a proposed Saturn missile booster plant. City Mayor Victor Schiro said last week that the Saturn work would create 10,000 new jobs.

WHICH CAME FIRST?—A million cu yd of filled-in river bank slipped into the Hudson River last week at West Point Military Academy. At first, the slide was blamed on a mysterious 8- to 10-ft-high wave, but armchair geologists now surmise that the slide came first and caused the big wave. Officially, no one is quite sure what happened.

LESS SHOPPING FOR THE CORPS?—A proposal backed by Defense Secretary McNamara would strip the Corps of Engineers of much of its purchasing authority. Under the present system, each of eight so-called single managers buys common use items for the military services. The Corps, for instance, is responsible for buying construction equipment and building materials. Secretary McNamara wants to create a Defense Supply Agency in the Pentagon to centralize purchase of all common-use items.

HOODOO STILL HAUNTS HOOD CANAL—The ill-fated Hood Canal Bridge in Seattle, completed only a few weeks ago (ENR July 13, p. 36), still has troubles. Now a 1¾-in. cable from one of the pontoons to a 550-ton anchor has snapped in 294 ft of water, allowing the pontoon to move a few inches out of line. Ship's anchors hold the pontoon in place until the fault can be corrected.

Cross-Sections of Typical Pavements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Crushed slag base
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Subbase: Granulated slag or slag screenings
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TRADEMARK

WASHINGTON OBSERVER

- **JFK backs public works to create jobs**
- **Housing for elderly program matures**
- **Democrats still fight for school aid**

- **Standby authority for a public works program to combat unemployment may be sought by President Kennedy next year.** He indicated as much in a letter to Senator Joseph Clark (D., Pa.). The President did not support this year a bill by Senator Clark calling for $500 million in matching federal grants for local projects, to be terminated when unemployment falls below the 4% level.

  Mr. Kennedy says he will support the bill and even an extension of it—when Congress reconvenes in January. The unemployment rate is nearing 7%, despite the business upturn, and, he says, "I have no intention of learning to live with prolonged and severe unemployment." If the rate remains high, says the President, it may be well to extend the scope of the Clark bill to include direct federal outlays for civil public works projects, resource conservation programs and other similar projects which can be started quickly.

—

- **Special federal programs for building housing for the elderly now are well under way.** Housing Administrator Robert C. Weaver told a Senate subcommittee last week that applications for federal funds are pouring in at a rate of $30 million a month. Applications for a total of $100 million already have been received for direct loans to non-profit institutions organized to build and operate housing developments or apartments.

  The program is off to a faster start than had been expected. Some 5,200 housing units designed especially for older families already are under construction, and another 20,000 such units are in various pre-construction stages. Witnesses told the subcommittee there still is a dire need, however, for similar housing units for lower income elderly persons—including those on welfare. All those being designed now are for persons with moderate incomes.

—

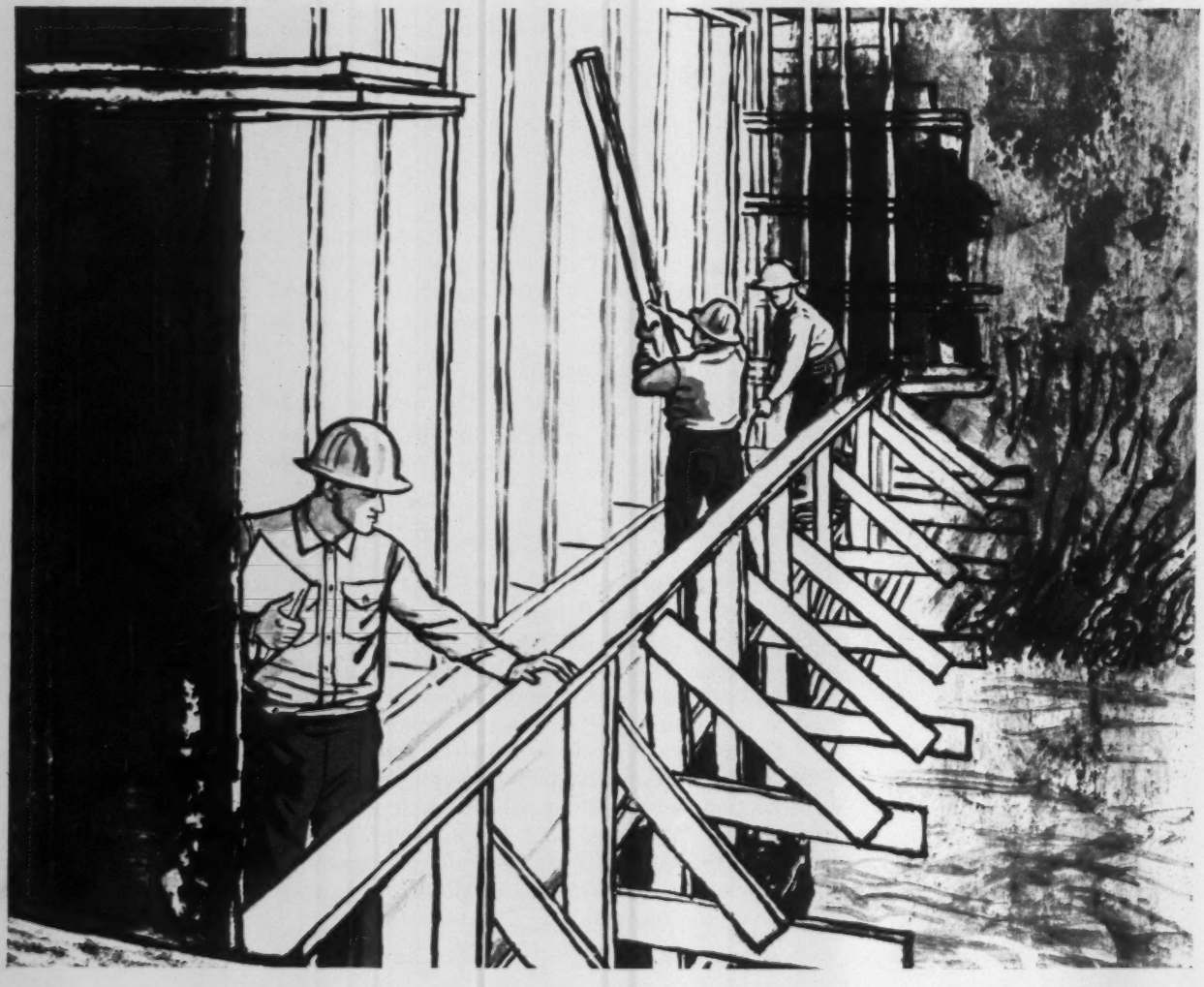
- **Democrats are making a last-ditch stand to get at least part of the Administration's school-aid program through Congress.** Likely result is a one-year extension of aid to schools in impacted areas—areas in which defense installations and plants have abnormally swollen the populations. There is some hope for a provision calling for $900 million in grants and $600 million in loans to help build college academic facilities. But passage of the rest of the construction program is doubtful. If the House Rules Committee continues to oppose it, it would have to be brought to the floor for a vote through cumbersome parliamentary procedures—extremely difficult at this late date.

—

- **The downturn in construction-loan and mortgage interest rates has halted.** That, at least, is the opinion of board chairman Joseph P. McMurray of the Federal Home Loan Bank board. Surveys of larger savings and loan associations during the past year have shown a slight but consistent decline in interest rates. A mid-summer survey, says Mr. McMurray, shows "little indication of any clearly defined direction in the movement" of interest rates.

PROTECTION IN DEPTH

How it helps cut compensation costs



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These and other services of Liberty's protection in depth helped save many millions of dollars for Liberty Mutual workmen's compensation policyholders last year. To learn more about Liberty's protection in depth (and how it can help save *you* money), just call the nearest Liberty Mutual office.

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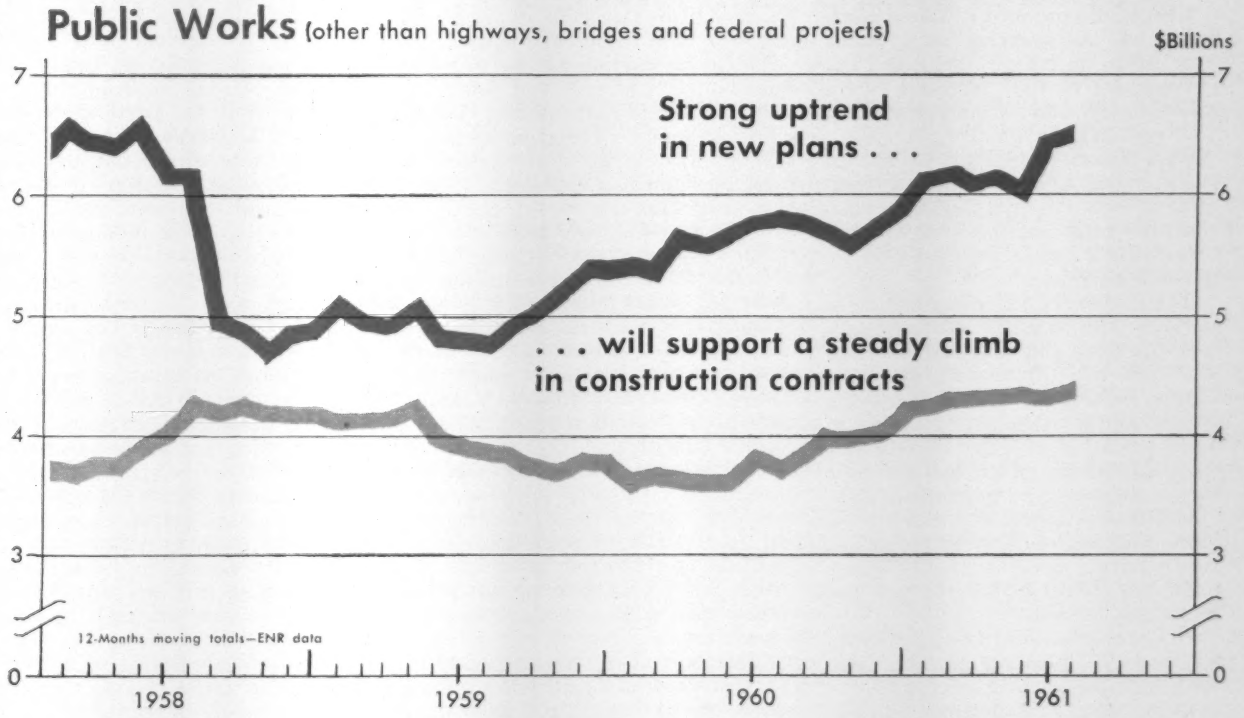


Federal Funds Spur Local Plans

Public works, backbone of the 1961 heavy construction market, are in the early stage of a sustained rise. The early Sixties are going to see the public construction contract records of the Fifties fall in swift succession. Why?

- The highway and bridge market was legislated into a new growth trend by the Highway Act of 1961.
- Federal construction awards will rise in line with the newly-established policies and stated intentions of the Kennedy Administration.
- Federal funds are bulldozing state and local public works other than highways and bridges into a new expansion period. The Community Facilities Administration's programs enable hundreds of small towns to initiate planning of needed public works and to borrow construction money at reasonable rates.

The soaring public works market that's ahead will differ from the boom of the Fifties. Not that there'll be different basic demand factors in play, but because "Smalltown, U. S. A." will participate more fully in the new expansion.

The well-heeled Community Facilities Administration provides the helping hand that smaller towns often need to get started on necessary public works planning and construction. CFA, a unit of Housing & Home Finance Agency, makes public works planning advances to large cities.

Many small communities haven't their own public works engineer, much less department. And a good many communities don't have experience in hiring an engineer or architect to plan a needed project. Inexperienced communities find investors turn a cold shoulder toward them, especially if their plans haven't the professional engineer's stamp. Arranging a bond sale to finance the project may be next to impossible. Even when it can be arranged, the town may wind up paying premium interest because, being an unknown quantity, it's bond rating is correspondingly low.

This is where CFA fits in. Its potential role in supporting a major expansion of public works planning and construction is yet to be tested fully. The first real test begins this year. During the Fifties CFA didn't push the availability of its services. But last February President Kennedy's anti-recession strategy called for CFA regional offices to beat the bushes to stir up action on pending public works. Objectives were to rush to construction status those jobs completely planned and to push planning to completion on other projects.

The results of this anti-recession activity aren't clearly defined. But one thing is clear: Inquiries have been flooding into 1626 K St., N.W., Washington 25, D.C., since the passage early this summer of the Housing Act of 1961. This act beefed up CFA financially. Its revolving fund for public facilities planning advances was increased $10 million to $58 million.

The record for the first seven months of 1961 is an impressive sample of what CFA can do once it starts to promote. During this period it approved 265 planning advances totaling $9.8 million. The projects involved had an estimated construction cost of $555 million. The money will be used to pay planning costs on a broad spectrum of construction, but most frequent use this year has been for sewage treatment plants and other sewerage construction—114 advances totaling $2.5 million to plan projects estimated to cost $146 million. Other common types of projects planned with CFA-advanced funds are waterworks, schools and other public buildings (see table.)

(*Please turn the page*)

Through July, 1961, CFA had authorized 9,462 planning advances for a total of $107.5 million. These planning advances have resulted in construction valued at $2,750 million.

CFA is also prepared to take a much larger role in financing local public works than it has in the past. The Housing Act of 1961 increased CFA's public facility loan authorization from $500 million to $650 million.

CFA makes these loans to finance public works in cases where a community with less than 50,000 population can't get private investors to bid a "reasonable" rate of interest on the town's bond issue.

There were 19,457 communities in the U. S. with 50,000 or less population in 1960, containing about 64% of the total U. S. population, according to the Census Bureau. CFA in July cut the interest rate it charges to 3⅜%, and to 3⅛% for areas of persistent labor surplus (depressed areas), which can qualify if their population is no greater than 150,000. The new interest rate makes these loans attractive to many communities. Unless private investors bid a lower interest rate, CFA is likely to buy the community's bonds.

Still, a large number of communities that use CFA planning advances have used the capital market successfully for financing their construction projects. This is one reason why far fewer public facility loans have been approved than have planning advances this year.

In the first seven months of this year, CFA approved 51 loans aggregating $12 million for projects estimated to cost $13.2 million. These loans were distributed among 20 states; all but four went to communities with less than 5,000 population. Nearly all projects were in southern or western states, the most numerous; Alabama, Texas, Oklahoma, Arkansas and Californina.

Waterworks projects costing $4.3 million accounted for 29 of these loans; sewerage valued at $6.6 million accounted for 17 loans; waterworks-sewerage worth $1.2 million was involved in five loans; and one $1.1 million loan was for natural gas distribution facilities. Loan amounts ranged generally from $100,000 to well under $1 million. Three hit $1 million and 15 were for less than $100,000. Project cost ranged a little higher than loans.

The loans have proved vital to many communities, serving to stimulate local construction and development. When CFA last spring surveyed borrowers to find out what benefits had accrued to them as a result of the loans, the replies went like this:

- Wheeler, Tex., which borrowed to build waterworks and sewerage, credited the CFA loan with leading to about 85% of a long list of 30 new buildings and business establishments that included a tourist court, bowling alley, municipal swimming pool, gas station, cafe, grain storage building, truck barn for a milk company, an auto dealer's building and an addition to another dealer's building, farm equipment dealer's building, telephone dial exchange, electric power substation, real estate office, welding and blacksmith shop . . . This may be an extreme, but it shows what can happen when needed basic facilities are provided by a town.
- Josephine, Tex., reported that because of its new water system "three houses moved from the country into town". The town built a new $3,000 firehouse and bought two fire trucks.
- Mill Spring, Mo., said, "real estate is up 40% . . . no unoccupied houses are for sale or rent. . . ."
- Dearborn, Mo., had a 15% population rise after it built its water system.
- Muscotah, Kan., said its new water system permitted modernization of its school, bringing it up to state requirements. The first new homes in 50 years went up.
- Emmet, Ark., reported that its water plant led it to organize a volunteer fire department. Its new water is so good it requires no treatment.
- Duenweg, Mo., says its new water system saved the town. "Our town was dying for lack of water . . . now we are going forward." Newly-built are a laundry, a $75,000 truck stop and a gas station.
- Cushing, Tex., reports that since constructing a new natural gas distribution system, "everyone seems satisfied that he is saving 40% over butane gas."

College housing loans by CFA hit $292 million in the first seven months of 1961. The money will pay for constructing dormitories, dining halls, service buildings and college unions. Borrowing institutions, public and private, often put up part of the money needed to build. So far this year, they put up a total of about $50 million, or an average of $1 for every $6 loaned them by CFA. College housing loans have piled up a record of $1,675 million approved for construction $1.745 million worth of buildings at 938 institutions for housing 385,000 students, plus 250 college unions, dining halls, infirmaries and other service buildings.

The Housing Act of '61 upped the college housing loan authorization to $1.2 billion spread over four years.

Public agencies are now able to tap CFA's program of direct loans for constructing "senior citizens' housing," new name of housing for the elderly. The Housing Act of 1961 added public agencies and private coops to private non-profit groups on the list of eligible borrowers. The act also upped the direct loan authorization to $125 million, more than double the $50 million previously available. CFA has in hand now about enough applications to exhaust the $45 million appropriated to date by Congress. And the heavy volume of applications that have been coming in point to a potential far greater than the $125 million authorization. Applications ran at a rate of $30 million a month this summer, which is more than the total outlays for this program since 1959.

CFA is about to assume still another role in spurring public works construction. **Negotiations are underway to define its role in the loan and grant program of the Area Redevelopment Agency**, newly-created unit within the U.S. Department of Commerce. CFA will have a major administrative responsibility. Appropriate coordination with its regular public facilities loan program will be worked out.

Though ARA hasn't received its first appropriation, it has approved the first development project—a $129,000 grant and $31,000 loan to finance a new water system for Gassville, Ark. (ENR Aug. 3, p. 57.)

Depressed areas have come to CFA for help in the past and obtained public facility loans. One of the largest is a $1.1 million loan this year to Silver Bow County, Mont., to finance a new interceptor sewer.

Public Works Planning Advances Approved in '61

Community Facilities Administration, Housing & Home Finance Agency

Type of Work	Number	Amount Advanced (thousands of $)	Project Cost Estimate (thousands of $)
All types	265	9,802	555,462
Waterworks	39	2,278	160,148
Sewerage	114	2,520	146,412
Other sanitary	3	205	5,998
Bridges	3	178	11,416
Streets	9	134	5,579
Buildings, total	70	3,200	171,136
Schools	46	1,046	52,544
Hospitals	7	120	8,075
Other building	17	2,034	110,517
Other	27	1,286	54,773

Two experts debate the pros and cons involved in . . . .

Rapid Transit for Golden Gate Bridge

Use of the Golden Gate Bridge for rapid transit trains now depends on which engineer the Board of Directors of the Golden Gate Bridge and Highway District thinks is correct.

Their consultant, Clifford E. Paine, said early this month that such a step is impractical (ENR Aug. 10, p. 21). But Carl H. Gronquist, consultant for the San Francisco Bay Area Rapid Transit District, had reported last March that it is practical. And he reiterated this position last week in a rebuttal to the Paine report.

Major points of difference between the two positions relate to cable stress; navigation clearance; reconstruction of stiffening trusses; and substitution of open grating for concrete on the sidewalks.

Part of the difference in opinion on cable stress stems from just how much the bridge will be loaded by rapid transit trains, and part from what is an allowable stress in view of present day suspension bridge design practice.

Both agree on a live load of 1,100 lb per ft of track for rapid transit trains. But Mr. Gronquist feels that two trains per track on the main span is "reasonable and properly conservative." Mr. Paine says, "It is not conservative thinking to assume that no more than two trains per track will be on the bridge at the same time . . .", a view, however, that is challenged by Keneth M. Hoover, chief engineer of the transit district.

Labelling Mr. Paine's belief—that there could be no guarantee that the tracks would not be loaded end-to-end—as "patently ridiculous," Mr. Hoover says that a block control signal system could limit trains on the main span of the bridge to one at a time, if that were desirable.

With respect to train weight, consulting engineer Ralph Tudor, who helped plan the proposed rapid transit system, says that the 1,100 lb per ft figure was developed early in the studies, while it appears now that lighter weight trains, reducing the live load to 900 lb per ft, can be used.

Mr. Paine, in his report, said that the bridge was designed using an allowable cable stress of 82,000 psi. He feels that today an appropriate allowable stress would be 86,000 psi, but calculates the stress under his proposed loading at 94,000 psi.

Mr. Gronquist recommends an allowable stress in the cable of 90,000 psi. This represents 40% of the minimum ultimate strength of 225,300 psi to which the cable was tested at the time the bridge was built. Mr. Gronquist calculates the cable stress at 88,000 psi with only one train per track, and 90,000 psi with two trains per track. In commenting on the 90,000 psi stress recommendation, Mr. Tudor pointed out that this is the design stress being used for the Narrows Bridge in New York where the same kind of wire will make up the cable.

One of Mr. Paine's primary arguments against rapid transit on the Golden Gate Bridge centers on impaired navigation clearance. His calculations were based on maximum highway deck live loading, full rapid transit loading and an air temperature of 110 F.

Mr. Gronquist agrees with his calculated deflection for such extreme condition loading, but points out that such a loading could occur only infrequently. He suggests as a proper procedure an application to the Department of the Army for an amendment to the original permit, and believes that it is "improbable that this reasonable request would be refused." Mr. Gronquist concludes that infringement on navigation clearance "would not by any means rule out rapid transit on the Golden Gate Bridge."

Another point of difference concerns the practicability of reconstructing the stiffening trusses. Among other things the top chord of these trusses would have to be strengthened. This would entail attaching plates to the top of these members by high strength bolts; also burning off the lacing on the bottom of the members and replacing it with perforated cover plates.

Mr. Paine contends that "such an extensive fabrication cannot be performed acceptably in the field even by expert mechanics." Mr. Gronquist, although admitting the difficulty of the task, says that Mr. Paine's contention is "most certainly not correct."

In commenting on this point Mr. Tudor expressed the opinion that the job currently under way on strengthening the upper deck of the San Francisco-Oakland Bay Bridge to carry truck traffic is more difficult than the one proposed for the Golden Gate span. Floorbeams are being replaced under full traffic load, and Mr. Tudor said the work is proceeding effectively and efficiently.

A point of minor difference between Mr. Paine and Mr. Gronquist has to do with replacement of the two 9 ft 4 in. concrete sidewalks with open steel grating. Mr. Gronquist, citing wind tunnel tests, recommended open grating for better aerodynamic stability and also as a means of reducing dead load. The crux of this argument strangely enough is women's high heels. Mr. Paine says pedestrians wearing high heels are certain to get the heels caught, and might suffer physical injury, but Mr. Gronquist contends that any woman who sets out to walk the bridge (its main span is 4,200 ft long) would go equipped with low-heel shoes.

Military Building Bill Readied

The Senate last week approved $1.02 billion of new money for military construction in the current fiscal year, $137 million above the House-passed figure. Differences between the two versions are to be reconciled by conferees.

Odds favored retention of Senate increases in the compromise bill. The House had followed the advice of its appropriations committee in passing an $883-million stripped-down measure, $150 million below Defense Department requests. The Senate restored most of the cuts and added some items to boost the total within $27 million of the Administration's latest revised estimate of military needs.

Missile and space facilities get a large share of the money. The Senate restored $12 million of a $27-million Defense Department fund for these activities. Some $285 million of a $539-million Air Force appropriation will go into missile bases. In addition, construction funds are provided for Navy Polaris and Army Nike-Zeus facilities.

About 14% of the Air Force construction budget is earmarked for early-warning radar facilities. More than 5% will go into construction of research and development facilities.

Hospitals and laboratories are among the major items restored by the Senate. Included are four Air Force hospitals, three Army research installations and a Navy lab for graduate officers training.

A substantial sum of $36.4 million appears in the bill for construction of 2,000 units of family housing. Financing of houses with appropriated funds will supplant the privately financed Capehart housing program, which Congress is terminating this year.

Road Engineers Go Electronic

A Rip Van Winkle-type highway engineer—absent from the scene for a decade or less—who wandered into the Somerset Hotel in Boston last week probably would have left in a hurry convinced that he was not among his own kind.

For the air buzzed with talk of aperture cards, nuclear probes, terrain data model systems, self-luminescent signs, automatic highways, dataphone transceivers and similar concepts that seemed to belong more to a gathering of physicists or electronic engineers than to highway builders.

The occasion was a two-day regional conference on improved highway engineering productivity sponsored by the American Association of State Highway Officials in cooperation with the Bureau of Public Roads, Massachusetts Department of Public Works and engineering schools in the Boston area.

The meeting pivoted around present and future uses of electronics in highway location and design, bridge design, urban highway operations, management, specifications and construction methods.

Engineers and administrators described systems and techniques now in use, pending developments and challenges of the future. Big emphasis was on electronic computers and their manifold applications to highway engineering. But photography, aerial photogrammetry, nuclear energy, rapid data transmissions systems and other recent developments got their share of attention.

Two young professors from MIT snared the spotlight with descriptions of comprehensive computer systems under development at the MIT Civil Engineering Systems Laboratory.

Paul Roberts described the approaching culmination of efforts to develop a comprehensive highway route location evaluation based on the original concepts of the digital model terrain system.

Its purpose is the rapid quantitative evaluation of alternative solutions. The complete attack on the problem consists of a series of carefully integrated computer programs and rapid solution techniques (most of which are already in use) each designed to perform a specific part of the overall analysis while still being useful alone. The complete system will include a geometric locator, an earthwork program, a method of computing structures costs, a drainage cost estimator, a land cost program, and a determination of vehicle operating costs.

C. L. Miller, director of the systems laboratory, took the lid off a new programming system for solving geometric problems on a digital computer. The new system is called COGO. It has these characteristics:

- Instructions to the computer are at about the same technical language level that one engineer would use in describing the solution to another engineer. Words like "ADJUST" and "LOCATE" are used.
- A new and unique program is written for each set of data.
- Programs are written only once and then discarded.
- Each command and the data to be used in executing the command are entered into the computer and at the same time.

Biggest problem now facing the highway departments in effectively using data processing systems is rapid transmission of data from the field to a computing center. Industry spokesmen described in detail rapid data transmission systems now available and on the horizon.

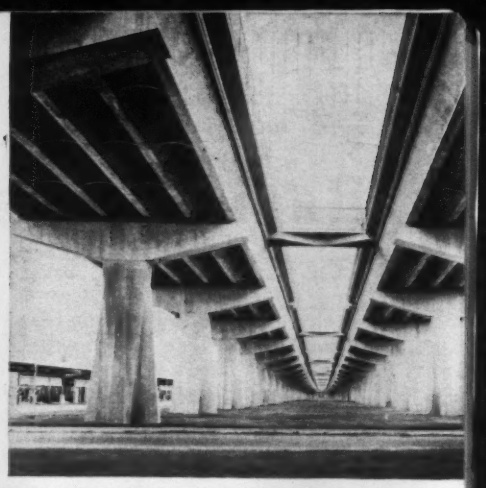
Most of these systems make use of telephone lines, which can take data at tremendous rates at comparatively low cost. Already widely used by the armed forces and private industry, very few highway departments have adopted such systems. Ohio—a leader in the whole field of electronics—has installed transceivers in three district offices, plans to put them in nine more. Industry leaders agree that the next big breakthrough in highway department operations will be in this area of communications.

W. D. Ashton of the Ohio Department of Highways described types of self-luminescent traffic signs now under development. A prototype sign will be demonstrated in Ohio next year. Self-luminescent signs are expected to reduce sign maintenance costs and increase highway safety.

T. F. Morf, of the Illinois Division of Highways, told of plans to evaluate and control traffic on existing freeways in the Chicago area.

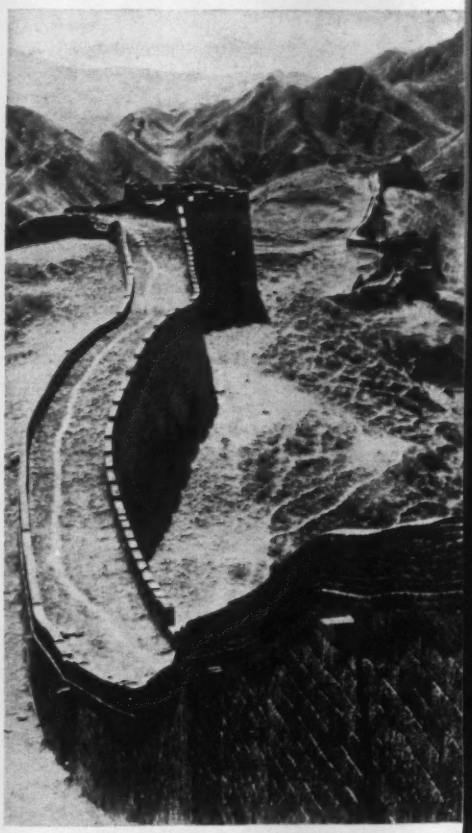
Ramo-Wooldridge is doing a comprehensive study of factors affecting freeway traffic flow, existing vehicle sensing devices and evaluation equipment, and other factors. Completion of initial phases of the study will be followed by design and construction of an experimental installation intended to produce optimum results in freeway operation. It is not yet known exactly what equipment will be used, but maximum use will be made of existing devices.

R. H. Sheik of Ohio described three major operations now in use in that state to speed payments to contractors. These are pre-construction aerial photography, photogrammetric-computer methods of measuring final earthwork quantities, and computer processing of semi-monthly and final estimates.



FLUTED LANES of a Roman highway shelter

SERPENTINE roads in Swiss Alps make sinuous

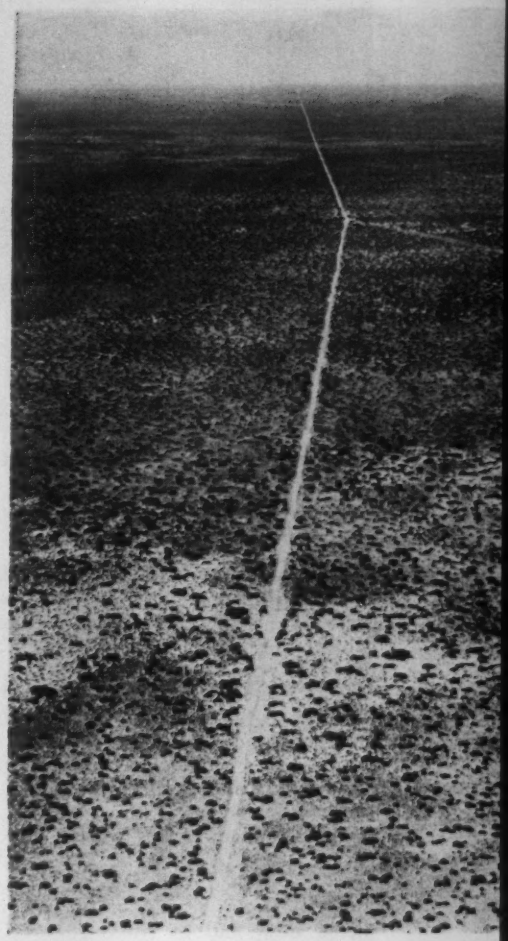


CRENELATIONS of China's Great Wall flank one of the earliest elevated roads.

park walks.

COILING highway will enclose a Caracas shopping center.

loops as they follow mountainous contours above Andermatt, near St. Gotthard Pass.



DESERT road is like abstract painting.

Art Discovers the Highways

New York City's Museum of Modern Art, which previously discovered art in a late nineteenth century Paris subway entrance, again finds art in transportation in its current exhibit, Roads.

Seventy greatly enlarged photographs are displayed on the art of roadbuilding —showing serene country lanes, fast-moving urban freeways, roads integrated with buildings.

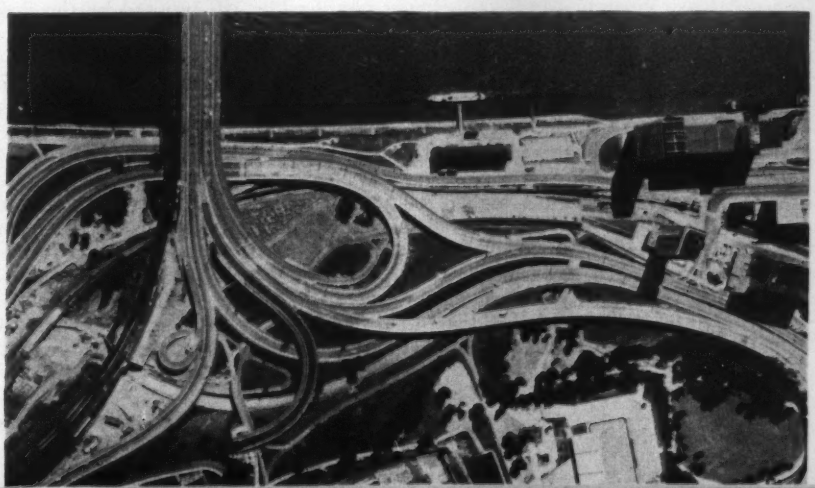
Architech-engineer Bernard Rudofsky, co-director of the show with the museum's architecture director Arthur Drexler, says: "Through these photos, you can see that which is normally missed by driving or walking—the road in its surroundings or the aerial view."

Despite the impressive contours and dimensions of recent highways, he prefers the older roads, which followed the contour of the land. "Today," he says, "land is built up to follow the highways."

The complexity of recently built highways may foster a new kind of architecture, road-inspired and road-conditioned, says the museum.

The exhibit on roads is unprecedented in museum history, including technical institutions, says Mr. Rudofsky. Through the aid of a CBS Foundation grant, Roads will soon tour museums and schools around the country, in late September.

INTERTWINING arcs of Carquinez Bridge approaches dominate landscape (above).



BAROQUE pattern of highways forms Rhine bridge approaches at Mannheim (left).

With spillway concreting nearly finished . . .

Hanson Dam Is Beating Schedule

Hanson Dam, a 235-ft-high rock-fill structure in Eagle Gorge on the Green River in Washington, will provide flood control this winter instead of next, as originally scheduled.

It is the second time since starting the job that the Kaiser-Raymond International joint venture has been ahead of schedule. Floods in November and December 1959 washed out the last time advantage.

Flood danger time in the Green River Valley is November to March. The 675-ft-wide dam, about 42 mi upstream from Seattle, is 60% completed now, and by working two 10-hour shifts a day, the contractors hope to have it almost done by winter. The intake portal is completed. Spillway concreting is well along although its two 45 x 30-ft tainter gates won't be installed until next year. The river now flows through the 900-ft-long, concrete-lined outlet tunnel, controlled by two tainter gates 10 ft wide by 12 ft high.

Although the dam's primary duty will be winter flood control (it will impound 106,000 acre-ft of flood water) it will also be used to even out the flow of the Green River during the summer. About 28,000 acre-ft of water will be retained out of the normal flow during March, April and May (after the flood danger but before the dry months) and rationed out during the low-flow summer months. Fisheries need about 28,000 acre-ft. The other 70,000 acre-ft will be available for municipal supply and other uses.

The Seattle District of the Army Corps of Engineers has over-all charge of the $40.5-million construction job.

Talks Proposed for Channel Link

French and British government officials have agreed to meet for talks on a cross-channel link between the two countries. This is a new development in this long dreamed of crossing, which has usually been envisioned as a tunnel but for which a bridge is now proposed.

The bridge project was submitted early this month by a French group composed of nationalized banks, construction companies, trade associations and shipbuilders. A detailed rail tunnel project, prepared by the Channel Tunnel Study Group and handed to the two governments in the spring of 1960, is already under study in Paris and London.

The bridge group known as Societe d'Etude du Pont Sur la Manche, is headed by Jules Moch, former French Minister, and the design was prepared by the Compagnie Francaise d'Entreprises with help of Dorman Long & Co of Great Britain and Merritt, Chapman and Scott of the U. S. It calls for a steel bridge 20.5 miles long with a maximum navigation clearance of 230 ft. There would be 163 spans on concrete piers.

The bridge deck is planned for five lanes of motor traffic, a double railway line and two lanes for two-wheel vehicles. A second deck could be added when needed. Tolls would average $18 per vehicle.

The cost of the bridge would be on the order of $600 million, compared to an estimated $317 million for the proposed rail tunnel. However, the bridge study group claims that the bridge would have much heavier traffic especially of freight, and thus higher toll revenues.

Although talks on an official level are being arranged, no details have yet been settled on the time and place of the meeting or the delegates that will attend it. High ministry officials will conduct the talks.

Congress Pares JFK's Saline Water Program

House and Senate actions last week on the saline water conversion program left sizable differences for conferees to iron out. One thing looks certain, however: Any compromise bill will take some of the sugar out of the desalting program the Administration wants.

The Administration has been entertaining hopes for an open-end program, with no stipulated spending limits. The Interior Department's Office of Saline Water has been making ambitious plans to build demonstration plants, starting with 13 of them during the next four years at a cost of $83 million, $53 million of it directly for construction. The Administration also wanted loan and grant programs to help water-short, economically depressed communities build conversion plants, and a technical assistance program to help foreign countries build plants.

The House last week passed a bill providing $50 million for a five-year research program and nothing for other activities. The bill would permit construction of demonstration plants with research funds but only with specific approval of Congress in each case.

The Senate Interior Committee later in the week added more. In executive session it voted to:

- Authorize a demonstration plant program with no budget restrictions.
- Raise the research allowance from $50 million to $75 million.
- Authorize a foreign technical assistance program.

The committee's action is almost certain to get easy approval of the full Senate. However, it is sure to touch off a battle with the House when the conference committee meets, probably early in September.

Construction Will Soar At New Rocket Launch

A new $1- to $2-billion rocket launching complex will be built at Cape Canaveral, Florida by the Army Corps of Engineers for the National Aeronautics and Space Administration. The new facility will be used by the Space Agency to send a three-man vehicle to the Moon and back by 1967-1969.

In all, some six or more launching pads will be built in the new complex. These will include two to three launching pads for the big Saturn C-3 booster that will be capable of putting some 50 tons of payload into orbit around the Earth, or send 19 tons to the Moon. Cost of each of the Saturn C-3 stands will run around $225-million.

The job of putting a three-man vehicle on the Moon will require two to three launching pads, costing some $500-million to build.

Four Dams in New Hydro Project

Pacific Gas & Electric Company has been granted a Federal Power Commission license for an $86.7-million, four-dam, 329,400-kw, hydro project on the McCloud and Pit rivers in northern California.

Company officials have not announced a construction schedule, but first construction contracts probably will be awarded late next year and the project completed in 1965 or 1966.

Roughly equivalent to one year's growth in PG&E power demand, the project will be part of a 10-year PG&E capacity expansion. Officials have announced that PG&E expects to double its generating capacity from 5 million kw to 10 million kw in the decade ending in 1970.

The McCloud-Pit work will be the largest PG&E hydro project in 10 years. Other hydro work currently under way includes the Kings River powerhouse at the headwaters of Pine Flat Reservoir and the rebuilding of two existing powerhouses. PG&E is also contracting for power delivery from several projects being built by local public agencies.

The new work will finish the Pit River development started by a PG&E predecessor company more than 40 years ago. Most recently completed phase of the work was Pit No. 4, finished in 1955.

The FPC license stems from applications and amendments made by PG&E between 1952 and 1959. The system planned includes four dams, four tunnels and three powerhouses.

Both the McCloud and Pit Rivers feed into Shasta Reservoir, formed by the Bureau of Reclamation's Shasta Dam. The new work calls for diversion of water from the McCloud River through a powerhouse into the Pit River. The combined flow will pass through two more powerhouses before reaching Shasta Reservoir. The McCloud River diversion will make it possible to increase the capacity of the two Pit River plants by 40%.

McCloud Dam will be farthest upstream of the four. Planned as a 235-ft-high concrete arch, it will impound a reservoir with a 35,300-acre-ft gross capacity. Water level will be controlled by seven 40 x 11½-ft radial gates on an overflow spillway.

A 40,500-ft-long, 17-ft-dia horseshoe tunnel will feed water from the McCloud Diversion Reservoir to Iron Canyon Reservoir, formed by a 175-ft-high earthfill dam on Iron Canyon Creek, a Pit River tributary. Iron Canyon Dam plans call for an ungated side channel spillway with water flow control coming primarily from McCloud Dam. Gross capacity of Iron Canyon Reservoir will be 24,400 acre-ft.

Water from Iron Canyon Reservoir will pass through a 12,500-ft, 19-ft-dia, horseshoe tunnel and a 2,850-ft steel penstock to the McCloud-Pit powerhouse on the bank of the Pit River. Static head on the plant's Francis-type reaction turbines will be 1,217 ft. The plant will have two generators with 155,700-kw combined capacity. The single penstock will be a steel pipeline on the ground surface ranging in dia from 10 to 12 ft.

The two new Pit River dams will be concrete gravity, each with two 40 x 60-ft radial gates on an overflow spillway. Combined gross storage will be 49,700 acre-ft. Pit No. 6 will be 155 ft high, Pit No. 7 will be 205 ft high. At each, short 26-ft-dia horseshoe tunnels around one abutment will lead to a pair of 18-ft-dia underground penstocks that feed the powerhouse. Pit No. 6 powerhouse will have 73,800-kw capacity, Pit No. 7 will have 99,900-kw capacity.

Tunnels on the project will not be lined except where underground formations are not stable.

In 1959 the project was the subject of hearings before the California Water Rights Board. Both PG&E and the California-Oregon Power Co. had proposed conflicting projects. COPCO later withdrew its water rights applications.

Edward N. Noyes Dies; Noted Texas Consultant

Edward N. Noyes, who directed the Trinity River flood control project and was responsible for development of its bottom lands in the Dallas Vicinity, has died. He was 81 years old. Later he made the same kind of contribution to Corpus Christi with the seawall and park that is now the frontyard of its business district.

Mr. Noyes came to Texas in 1908, after his graduation from the University of Kansas, to serve as resident engineer on the Atchafalaya River railroad bridge, a famous deep pneumatic job. A few years later he was resident engineer for Hedrick & Cochrane, Kansas City consultants on Dallas' Oak Cliff Viaduct over the Trinity River, the longest concrete structure of its day.

Upon completion of this work in 1912, he joined a college classmate, E. L. Myers, to form the consulting firm of Myers & Noyes in Dallas, with which he was associated for most of his life. From 1927 until 1939, the firm was Myers, Noyes & Forrest when T. Carr Forrest, still a prominent consultant in Dallas, was a partner. In 1938, a branch office was opened in Corpus Christi, and Mr. Noyes spent the rest of his life there.

Long-Stemmed Flagwavers Solve Job-Site Headache

Morgan Construction Co., Inc., of Clarksville solved a knotty problem on a local paving project by correctly estimating the power of women.

Morgan has a contract with Montgomery County to widen a two-lane street to four lanes, two parking lanes and two sidewalks. This would be routine except that:

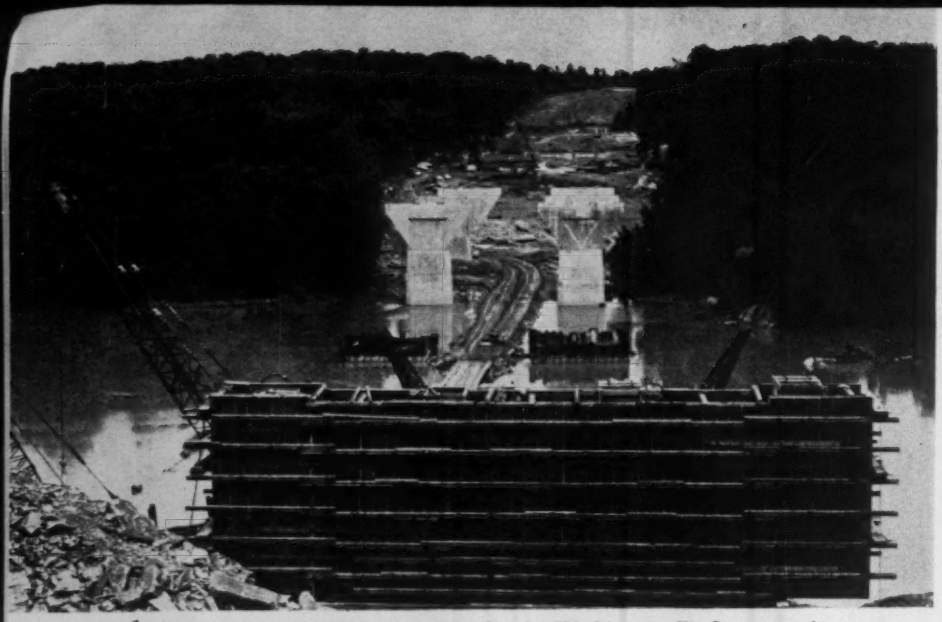
- Two lanes of traffic must be kept open.
- No detours are allowed.
- All work must be kept inside an 80-ft right-of-way.
- The county's only hospital is inside the job limits.
- Average daily traffic for the street totals 19,000 vehicles.

Morgan tried full-page newspaper advertisements, billboards, route markers and appeals to local self-interest to lure motorists onto alternate routes. These were partial or complete failures.

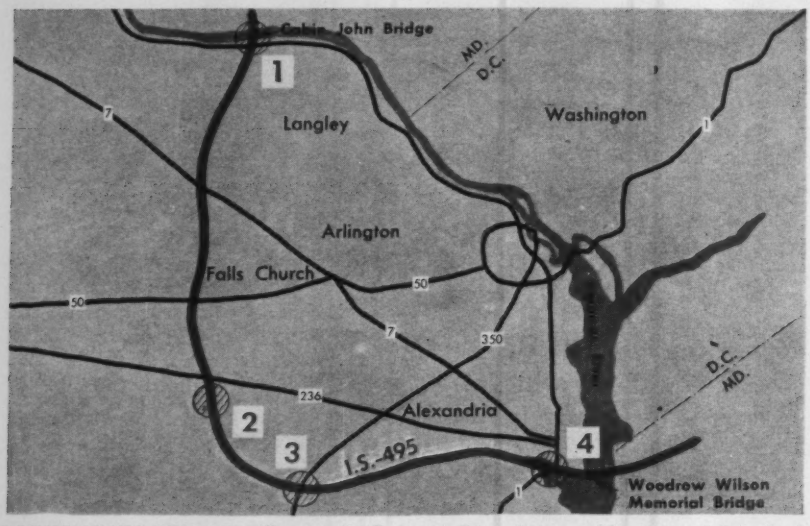
The contractor all but eliminated his traffic problem by hiring two new flagmen—two striking young ladies dressed in white blouses, shorts and sneakers.

These two ladies, both blondes, are Mrs. Kathleen Parker and Mrs. Donna Boyd. Simply by describing road conditions ahead to motorists and suggesting other routes, they reduced traffic 60% during working hours.

ENR's Index of Editorial Content for January-June 1961 has been mailed to those on the Index mailing list. If you wish your name added, please write to: Indexing Dept., Engineering News-Record, 330 West 42nd St., New York 36, N. Y.



1. **THE CAPITAL BELTWAY** will girdle the Washington, D. C. metropolitan area.



CABIN JOHN BRIDGE will span the Potomac River between Virginia and Maryland.

Virginia

Roadbuilders and their machines have been swarming over northern Virginia this summer on the state's 21-mile section of the Capital Beltway (Interstate 495), a circumferential route for Washington, D. C. The $70-million, four-lane divided highway is scheduled for completion in the fall of 1963, but some portions will be open long before that.

There is some tough construction involved, including a half-mile stretch near the south end, requiring vertical sand drains at the sprawling U. S. route 1 interchange. There are 49 major structures, not including box culverts and minor drainage installations.

The new route passes just south of historic Alexandria and slashes across burgeoning Fairfax County, bedroom for Washington. It cuts through industrial areas, high-density suburban developments and rolling farm land.

Its designers chose its location so skillfully that fewer than 100 houses had to be taken in acquiring the right-of-way.

• **Function and location**—The Capital Beltway will completely surround the District of Columbia. In Maryland, it passes through Prince Georges and Montgomery counties.

The Virginia and Maryland sections will be linked by two major bridges over the Potomac—the Woodrow Wilson Memorial Bridge at Jones Point, south of Alexandria (ENR Mar 30, p. 34) and the Cabin John Bridge at the northern end of Virginia's section (ENR June

2. **COMPLETED SECTION** of the Capital Beltway waits for the on-rush of traffic that will come with completion of the route.

Interstate Puts a Belt On D. C.

30, 1960, p. 21). The Wilson bridge—built by the Bureau of Public Roads—is nearly finished; substructure work is under way on the Cabin John Bridge.

Primary function of the beltway is to provide a bypass of the District of Columbia for north-south traffic. Almost as important will be its role as a distributor of D. C.'s metropolitan area traffic. In Virginia, Interstate 495 will have interchanges with Interstate 95 and 66 (main access road to Dulles International Airport, now under construction at Chantilly), the George Washington Memorial Parkway and six other primary highways.

Traffic estimates for 1975 for the circumferential route range from a low of 44,000 vehicles per day to a high of 110,000. Its completion is expected to spur industrial development in the area, particularly near interchanges.

In Virginia, the beltway will have nine major and four minor interchanges. Two of the interchanges sprawl over many acres. There also are ten grade separations and at least two railroad grade separations. At the moment, plans call for a railroad line to cross the beltway at grade in a place where construction is just getting under way. Only two trains a day use this line, and Virginia is hoping to persuade the railroaders to abandon the line altogether. If unsuccessful, the state will have to build a third railroad grade separation structure.

• **Design**—The beltway lies within a standard 300-ft right-of-way. As on all sections of the Interstate system, access is limited to the interchanges.

Generally, designers have provided four 12-ft traffic lanes with a median strip 60 ft wide. There are extremely long merging lanes (acceleration and deceleration) at interchanges. Pavement is reinforced concrete, except at the south end, where bituminous concrete will be used.

Fred Burroughs, resident engineer for the Virginia Department of Highways, says, "Extreme variation in soils and soil conditions, as well as the availability of natural sub-base material, dictated a varied cross section. In some cases, the subgrade has been capped with a select material having a high CBR; in other cases, the contractor will stabilize the soil with portland cement."

Because of a shortage of locally available select material on three construction sections, the department purchased a 40-acre borrow pit that has an abundance of high-CBR material. Overburden from this pit helps to supply some 500,000 cu yd of borrow needed on these sections.

On top of the select material or stabilized subgrade is high grade crushed gravel or stone, generally 6 in. thick. It serves as a sub-base for the concrete pavement.

On one section the state will pay contractors for earthwork on embankment quantities, rather than excavation, in a reverse of the usual procedure. Heaviest fill is about 70 ft high.

Several types of bridges appear on the beltway: steel girder structures with concrete decks; rolled steel structures with concrete decks; and prestressed concrete bridges. All have relatively short spans, less than 150 ft.

• **Route 1 Interchange**—The big directional-type interchange between the beltway and heavily traveled U. S. 1 (leading to Richmond and points south) is located just west of the Virginia terminus of the Woodrow Wilson Memorial Bridge. It falls smack in the middle of a marshy, wet area with surface soils of peat and muck.

The interchange incorporates some 4,000 ft of bridges, all on piles. There are timber piles and some steel H-piles on the detour bridges; those for permanent structures are prestressed concrete piles and cast-in-place piles.

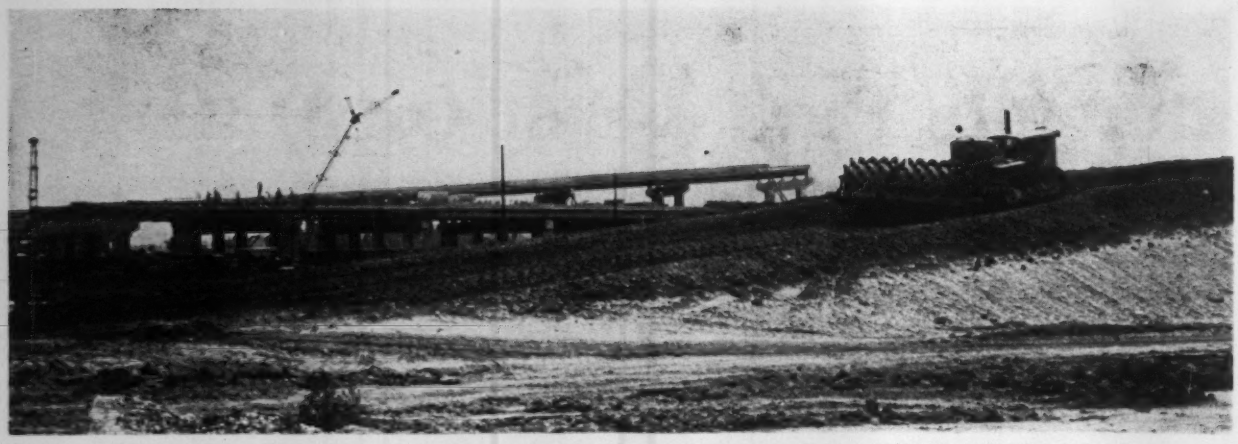
Most of the structures in the interchange are steel-girder spans designed for composite action. On the south end, engineers designed four-span continuous reinforced concrete units on pile bents. One whole quadrant of the interchange will be a structural causeway. Here, the contractor laid a working platform of fill about 6 ft thick over about 20 ft of muck; he then drove piles through the fill and muck into hardpan.

In the opposite quadrant, the contractor completely removed the muck and is backfilling hydraulically.

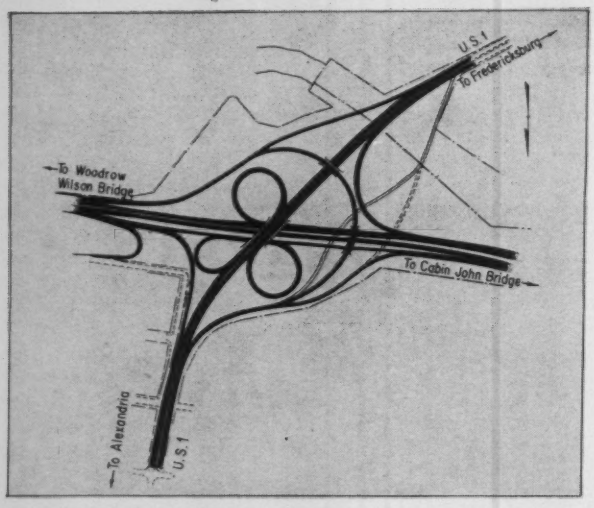
• **Sand drains**—Designers specified the installation of nearly 200,000 ft of 18-in. vertical sand drains to permit con-

3. **SHIRLEY MEMORIAL** highway interchange nears completion.

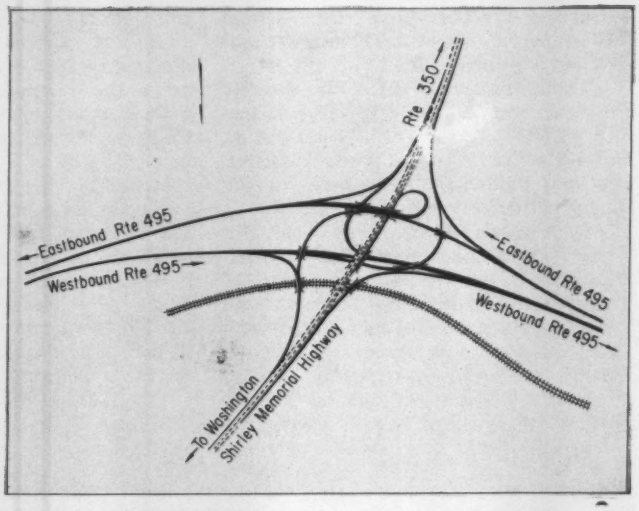
4. **INTERCHANGE DESIGN** is dictated by traffic on U.S. 1.



TAKING SHAPE —Men and equipment shape the sprawling interchange between the Beltway and U.S. 1 (See left, below).



U.S. 1 INTERCHANGE is a complex three-level design.



SHIRLEY INTERCHANGE spreads over acres of farm land.

struction of about 1 mile of roadway west of the big interchange. Drains will penetrate from 15 to 23 ft of muck and peat. They are spaced 9 and 10 ft on centers. Sand blanket over the drains will be 6 ft thick.

Hydraulic fill serves for the sand of the blanket and for backfilling areas from which muck has been removed. The contractor uses a 22-in. dredge to obtain the fill from a pit in the Potomac River about 2 miles south of the interchange. Two 22-in. dredges serve as boosters in pumping the material to a large area from which muck has been removed, in one quadrant of the interchange. From this point, a 10-in. dredge and a 12-in. dredge pump the material (in separate lines) to the sand drain area. Rehandling the material in this fashion permits the contractor to meet differing specifications for two horizontal layers in the sand blanket.

C. W. Kestner is VDH district engineer at Culpeper. Fred Burroughs is resident engineer with headquarters at Fairfax. Six assistant resident engineers have direct responsibility for various portions of the beltway.

CONTRACTS AND CONTRACTORS—CAPITAL BELTWAY, VIRGINIA

Nello L. Teer Co., Inc., Durham, N. C. & Bowers Const. Co., Raleigh, N. C.; Grade, Drain, Pave, 5 Bridges, $11,068,095, October, 1962 (Completion date).

Bowers Construction Co.; 5 Bridges, $832,815, July, 1962.

Talbott-Marks & Runions, Clarksville, Va.; 6 Bridges, $1,202,721, June, 1962.

Bowers Construction Co.; 8 Bridges, $1,568,485, September, 1961.

Hechler Brothers, Highland Springs, Va. & Talbot-Marks, Clarksville; Grade, Drain, Pave, $3,097,010, September, 1961.

Burkholder & Burkholder, Winchester, Va.; Grade, Drain, $516,700, Completed.

L. A. Reynolds Co., Inc., Winston-Salem, N. C. & Barnhill & Long, Inc., Tarboro, N. C.; Grade, Drain, Bridges, $1,636,500, Completed.

Talbott-Marks & Runion; Bridges, $1,132,900, Completed.

Nello L. Teer Co., Inc.; Pave, $1,767,500, Completed.

Richard F. Kline, Inc., Frederick, Md.; Grade, Drain, Pave, Bridges, $1,906,371, November, 1961.

Wright Construction Co., Odenton, Md.; Grade, Drain, Pave, Bridges, $1,275,600, July, 1962.

Harbor Construction Co., Linden, N. J.; 3 Bridges, $631,287, July, 1962.

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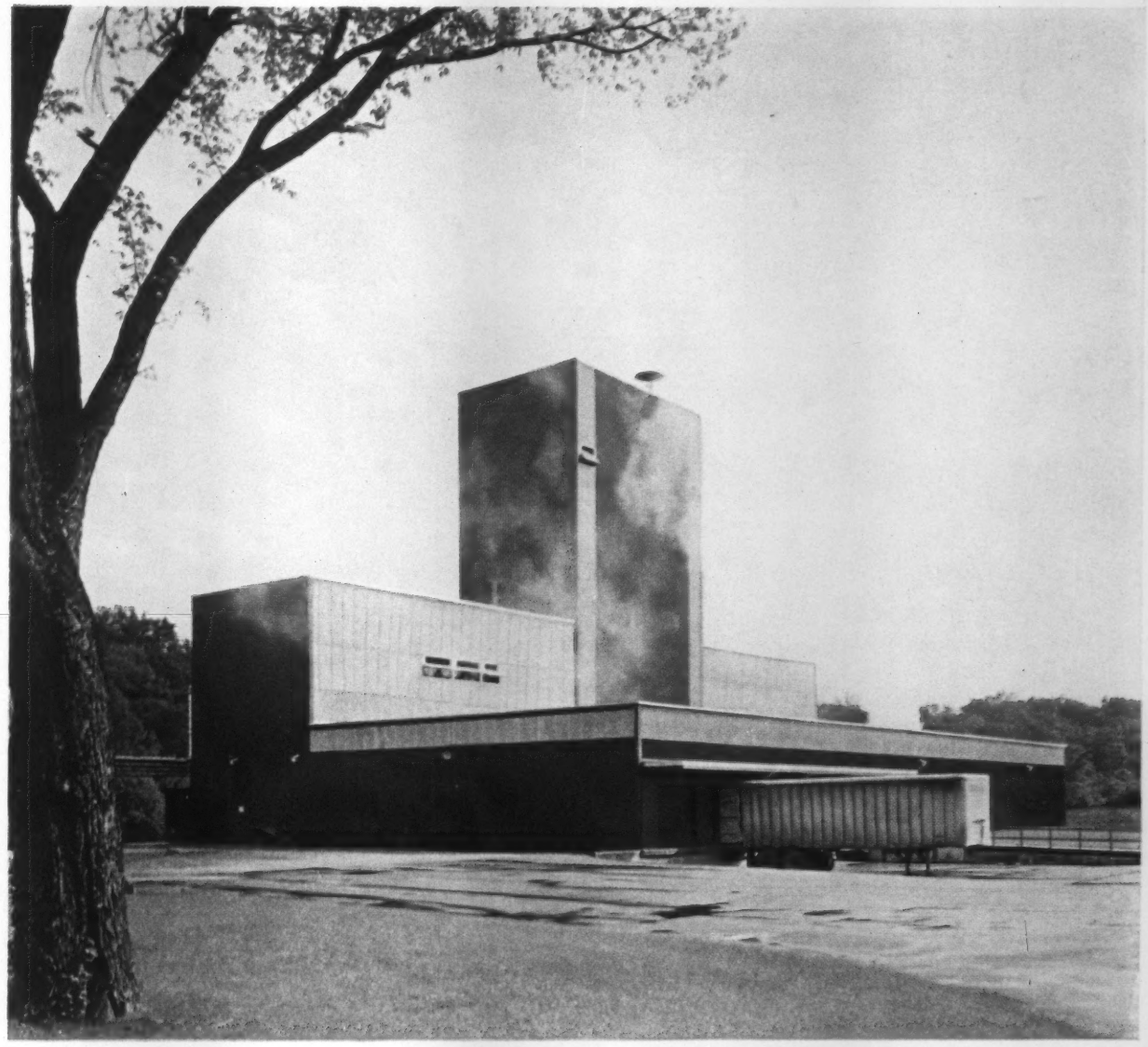

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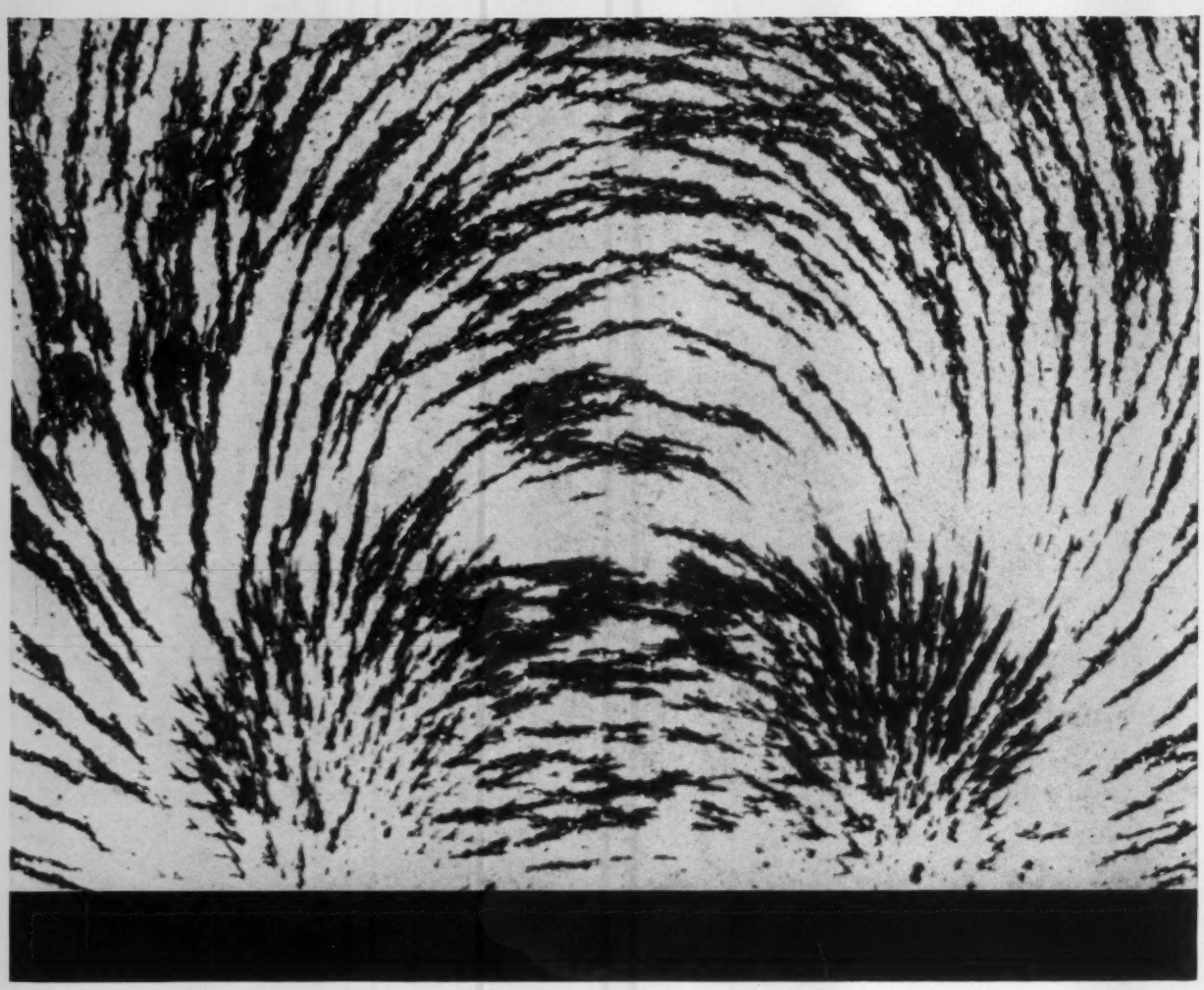

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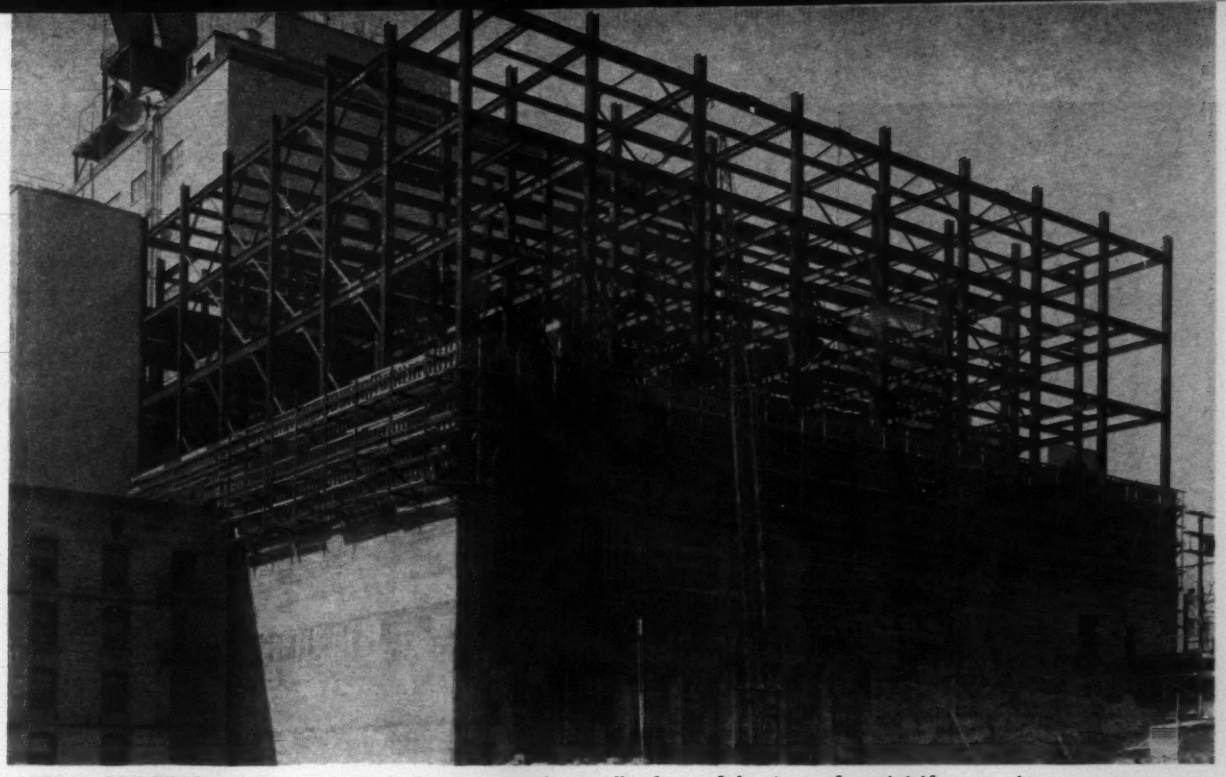


LATERAL BRACING for future seismic loads comprises shear walls, diamond bracing and semi-rigid connections.

Quake Defense in Three Systems

TELEPHONE BUILDING in Los Angeles will rise 16 stories with eight-story addition.

The problem of designing an eight-story frame for the seismic loads of tall future additions led to a three-stage lateral bracing system on the Pacific Telephone Company's new building in downtown Los Angeles.

Planned for the future are eight more floors, which may be topped with two 220-ft towers rising above the finished 16-story building. They will support micro-wave reflectors, which must be higher than other structures in the vicinity. The $4-million building, together with an adjacent building, will be the world's largest telephone switching center.

• **Three-stage seismic design**—Seismic bracing comprises three systems:

• Reinforced concrete shear walls, designed for full earthquake load, as the primary lateral bracing system.

• Diamond portal bracing designed to resist 30% of the total earthquake force.

• Semi-rigid column-girder connections.

This design theory assumes that even if a severe earthquake cracked the shear walls, they would damp much absorbed seismic energy through friction. The diagonal bracing would then have to resist only a fraction of the total seismic force.

The semi-rigid girder-column connections constitute a last defense. If a catastrophic earthquake caused failure of the two main lateral bracing systems, then the semi-rigid connections should at least keep the frame intact, the designers believe.

Reinforced concrete exterior walls formed natural shear walls, since they have few openings. This condition also makes possible use of diamond bracing, which skirts the openings.

The second-stage diamond bracing has two main advantages:

• It does not interfere with beam-column connections, since it connects at midheight of the columns and mid-span of the spandrels.

• Reduced l/r factors allow higher unit design stresses and allow smaller members with higher energy-absorption characteristics.

Beam-column connections of the third-stage bracing generally consist of heavy top and bottom angles. Connections to column flanges have unstiffened seats; those to column webs have stiffened seats. Field connections were made with $\frac{7}{8}$-in. high-strength bolts.

Robert W. Wilder is structural engineer; Woodford & Bernard are architects; Lindgren & Swinerton, Inc., is general contractor. All are from Los Angeles.

Bethlehem Steel Co. fabricated and erected the structural steel.

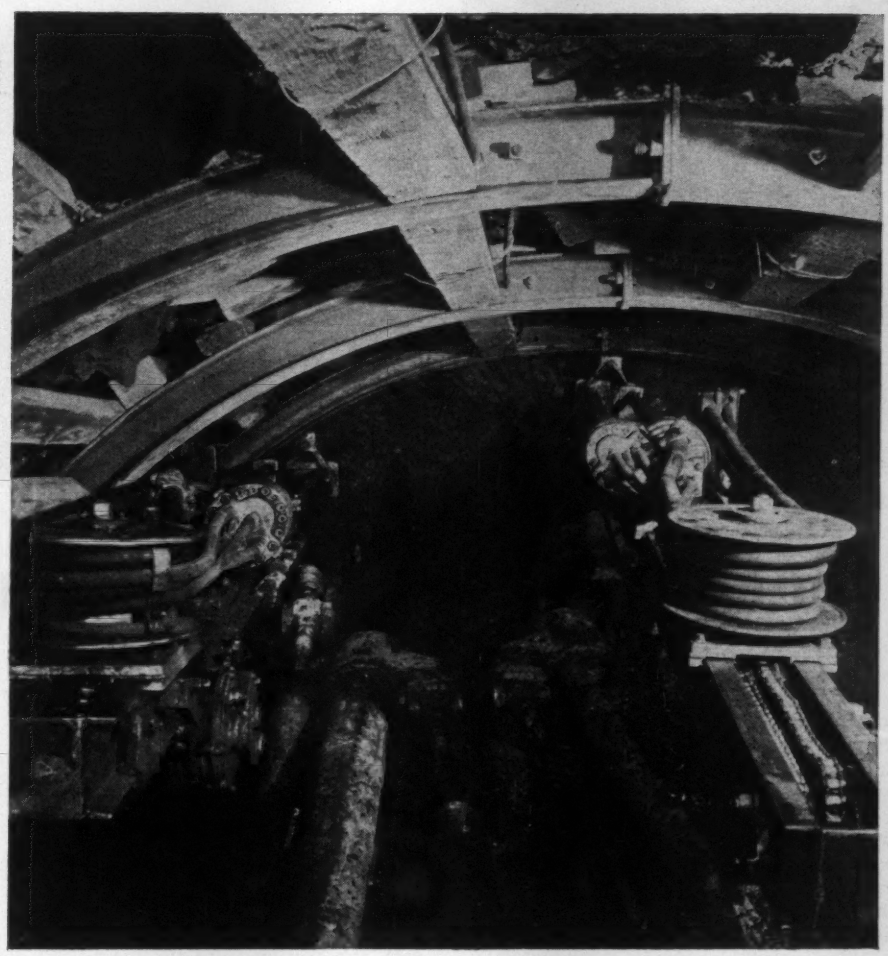
JOY RPD's DRILL THREE TIMES AS

New Rotary Percussion Drills Average 25 Minutes for Round of 48 Holes

Three times as fast as conventional percussion drills. That's the record of the new Joy Rotary Percussion Drills on the Carmen-Smith Hydro electric project. The RPD combines the best features of rotary drilling with percussion drilling and has speeded the operation to give the contractor a potential extra cycle per shift.

To drive the 7700 foot tunnel near the confluence of the Smith & McKenzie Rivers in Oregon, four RPD drills are jib mounted on a track-type jumbo. Using specially designed Joy tungsten carbide bits, the drills put 1¾" holes to an average depth of 8 feet. Hole cleaning is done with 140 psi water at 4 gpm. Penetration varies from 60 to 120 inches per minute. Rotation and feed pressure are variable to suit the formation.

The formation being drilled is conglomerate to dense basalt. The Joy drills are working at the upstream face of the tunnel while a jumbo with conventional 3½" drills is working the down-stream face. The RPD's are drilling out rounds of 48 holes in approximately 20 to 30 minutes, and workmen report occasional rounds completed in 15 minutes. The conventional drills are completing the same 48 hole rounds in an average of 60 to 90 minutes. The speed of the Joy drills has cut complete cycle time

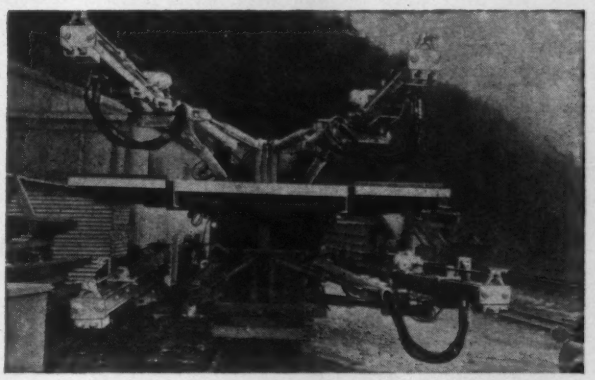


The Joy RPD combines the best principles of high speed rotary and percussion drilling. Rotation is provided by a hydraulic motor. The hammer blow is supplied by a high-speed free-piston percussion unit. Torque and feed pressure can be varied to meet drilling conditions, which gives the RPD high drilling rates, even in mixed formations.

FAST ON CARMEN-SMITH TUNNEL JOB

to as low as two hours. As many as four cycles a shift have been completed.

The Joy RPD can drill most formations with 1½" to 1¾" holes up to 16 feet deep. Mounted on Joy Hydro Drill Jibs it is particularly suited to highball tunnel operations. The Jibs may be mounted on your existing equipment, on jumbos, or on Joy self-propelled Drillmobiles. Your Joy representative can tell you what the RPD can do on your job and can give you an appraisal of performance in any particular formation. Get complete information on this new drill. Write for Bulletin 3384-24.



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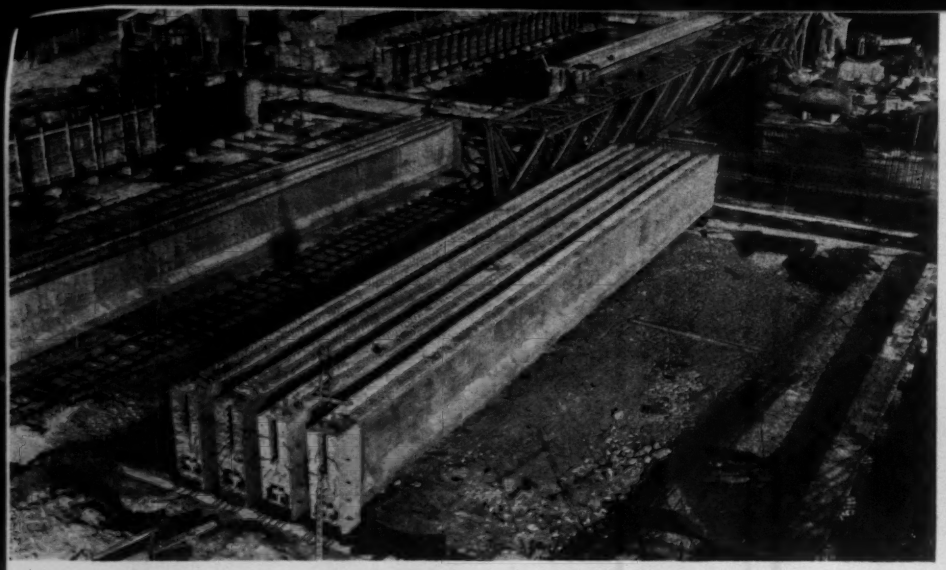
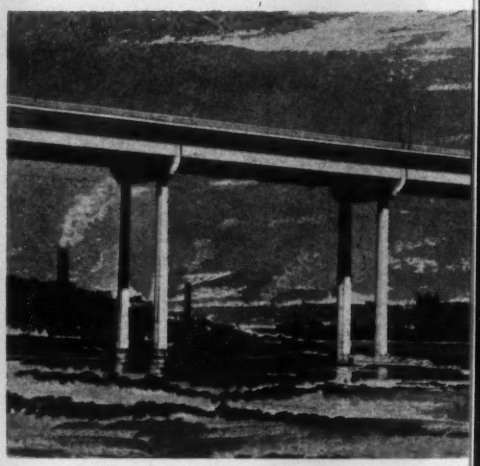


These giant prestressed concrete girders will go into . . .



Britain's new Medway Bridge.

British Set New World Mark in

The Medway Bridge, now under construction in Kent, southeastern England, will contain the largest prestressed concrete clear span in the world—500 ft (ENR July 28, 1960, p. 22). And the cost is expected to be a low $14 per sq ft of deck.

Approaches of the $6¼-million, 3,270-ft long structure are repetitive spans that incorporate prestressed girders among the largest ever cast, with lengths up to 135 ft and weighing as much as 190 tons.

And the joint venture contractors—J. L. Kier & Co. and Christiani & Neilsen, Ltd.—are using advanced construction techniques to speed completion of the bridge in 1963.

There are three spans in the river crossing. The record central span has two 200-ft cantilevers that support a 100-ft suspended span. A 312-ft anchor span flanks the central span on each side. The approaches total 18 spans ranging from 100 to 135 ft long, eleven on the west side. Width of the bridge deck varies from 113 to 137 ft.

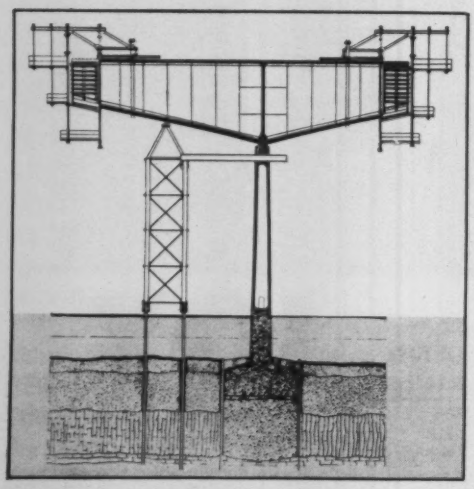
A striking aesthetic feature of the bridge is the two slender, tapered piers supporting the cantilever spans. These piers are 106 ft wide, and 6 ft thick at the top, flaring to 10 ft thick at the base. The central span will be about 100 ft above the water.

• **Superstructure design**—Consulting engineers Freeman, Fox and Partners of London designed the bridge for the Ministry of Transport. They prepared three designs, the other two in steel. The prestressed concrete design won on the basis of cost.

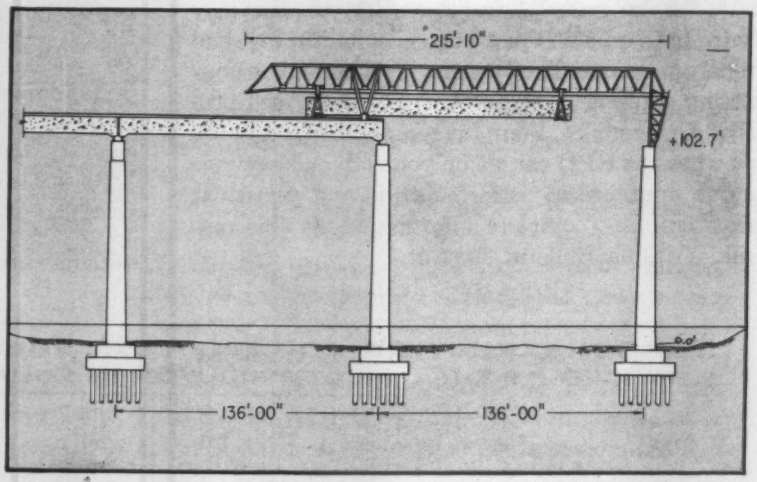
Two independent multi-webbed (three compartment) box girders form the cantilevers; each girder is half the width of the bridge. The girders have parabolic soffits, with maximum depth of about 36 ft. The designers chose cellular construction because of its torsional stiffness. Use of the parallel sections simplified the design by relieving the structure from the severe torsion resulting from traffic on the outside lanes on opposite sides of the deck.

The main river piers offer hinged supports. This behavior, in combination with the cantilevers of the main span, the cantilevered anchor spans and the simply supported suspended span, makes this portion of the structure statistically determinate.

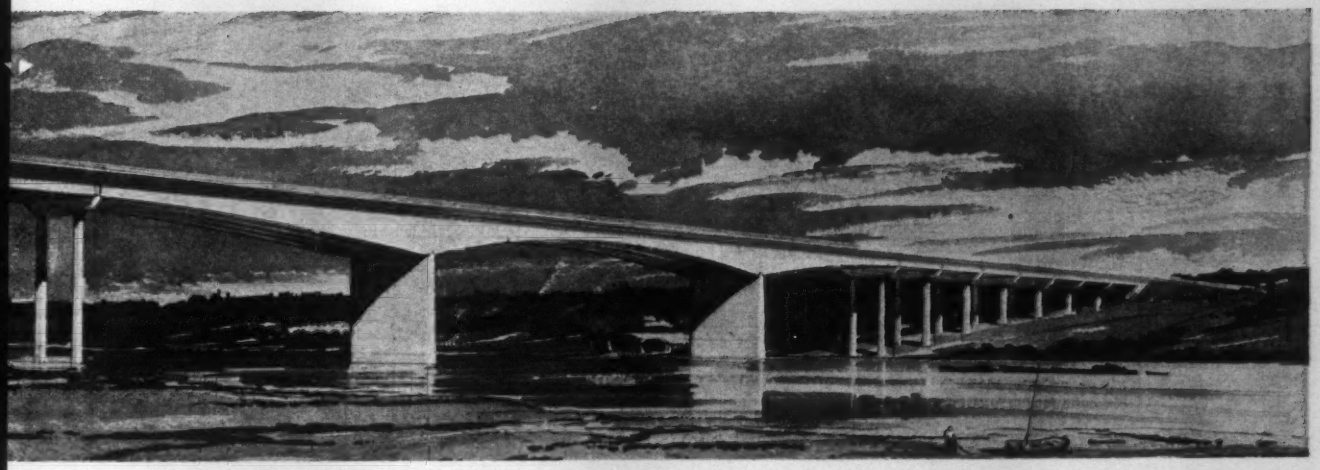
Since settlement of the main piers will not influence stress distribution in this part of the superstructure, the designers founded these piers on spread footings.



BUILDERS will cantilever from main piers.



LAUNCHING bridge handles and places long and heavy prestressed girders.



Central span of 500 ft will be longest of its type ever built.

the Bridge Olympics

Expansion joints at the ends of the anchor spans isolate the cantilevered sections from longitudinal forces. Suspended span beams are pinned at one end, have expansion joints at the other.

The approach spans have transverse continuity over each pair of slender piers. Possible settlement is critical, and all but six of the piers rest on piles. The approach spans rest on rollers over the pier bents; at the abutments, longitudinal forces react on knuckle joints.

• **Construction plan**—The contractors are building the bridge in four sections: (1) the main river crossing, (2) east approaches, (3) west approach abutment and the shoreward five spans and (4) the remainder of the west approach spans, which cross a swamp.

An access jetty extends from the shore to the river pier on each side. Use of the jetties was necessary because a tidal range of 18 ft would have bottomed floating construction craft and the banks were too soft to permit formation of an earth embankment. Embankments also would have interfered with river flow. Jetties are decked with steel and timber, with timber piles down to chalk or gravel (40-70 ft).

• **Foundations**—Underlying layer at the site is stratified chalk beneath a layer of loose gravel. Surface soils are soft clays and peat. Toward the west abutment, heavily fissured hard chalk outcrops. The river bed has a layer of fragmented and weathered chalk above the bedrock.

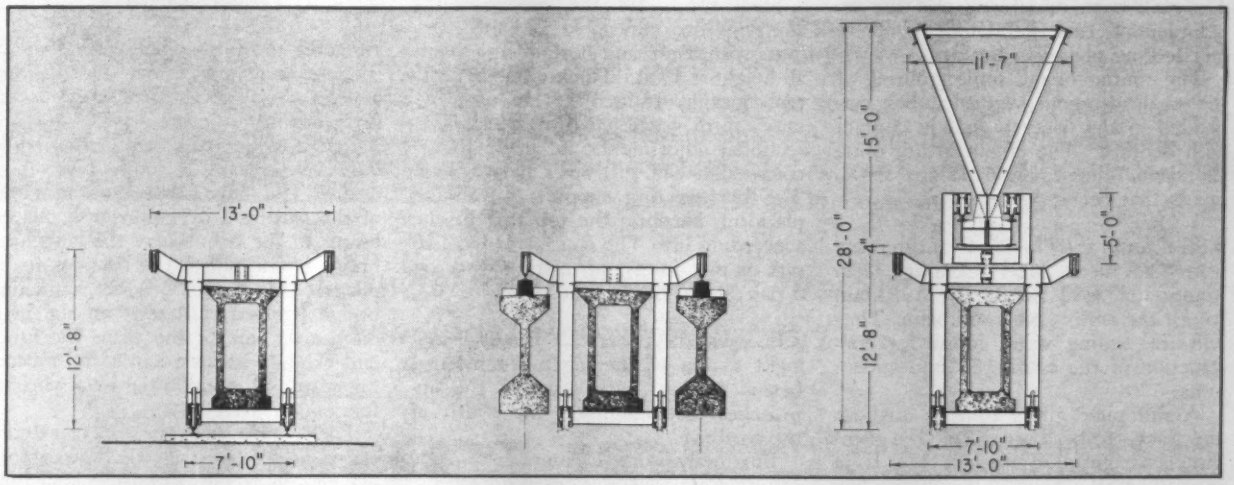
By pressure grouting the rock chalk under the west end of the approaches, designers were able to place the abutment and four pairs of piers on spread footings. Six of the remaining bents on that side are on piles, with cofferdams used to facilitate their installation. The remaining bent is on piles without cofferdam.

On the east approaches, the chalk is weathered nearly all the way from the shore to the abutment. The deposit is a hard rock chalk embedded in a soft matrix that is not amenable to consolidation by grouting. Here, the piers rest on deep piles extending to the bedrock chalk. Only the two outer bents and the abutment rest on spread footings.

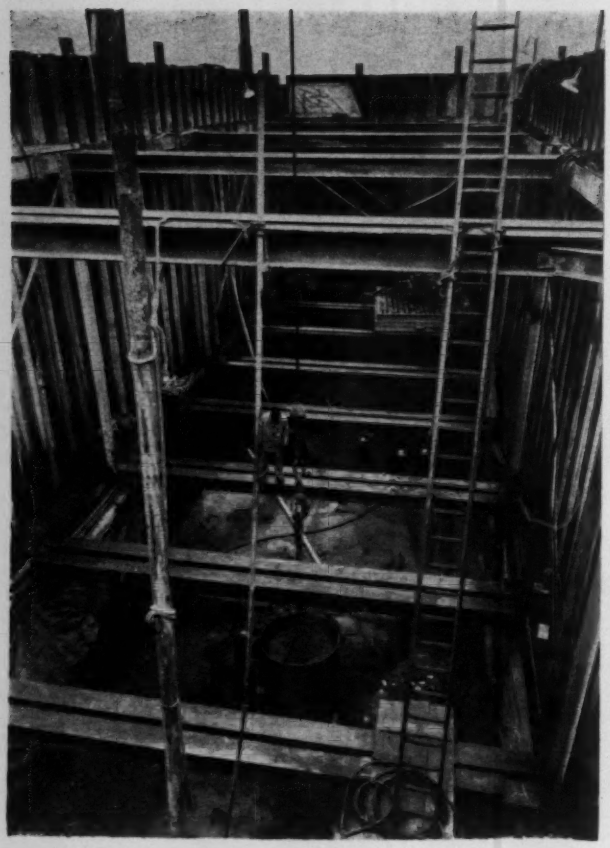
The 22-in. hexagonal piles range from 40 to 70 ft long and are among the heaviest ever sunk in Britain. The longest weighs 13 tons, with a design load of 155 tons; ultimate test load was 235 tons. Maximum permanent set of test piles at the site is $\frac{1}{8}$ in., elastic compression of chalk and piles another 0.2 in.

The contractor casts the piles on the site, at yards on each bank.

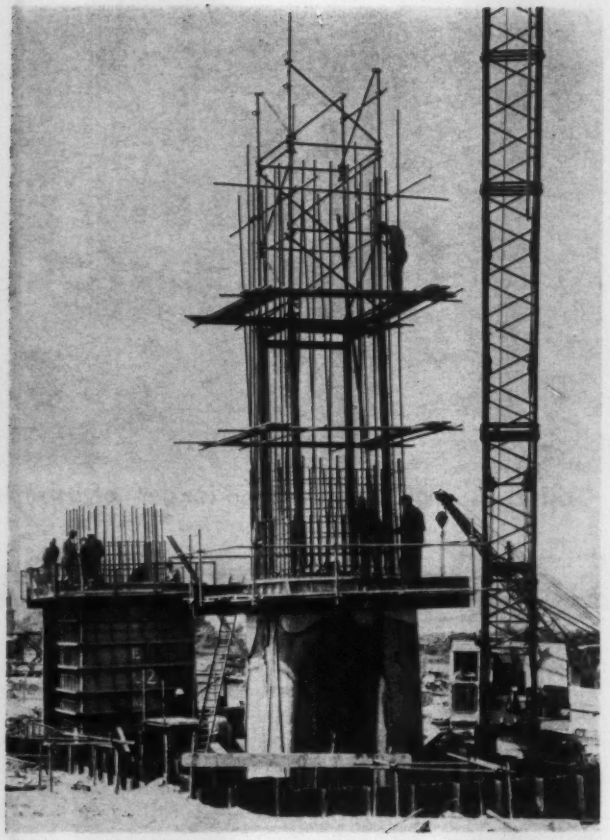
• **River pier cofferdams**—The contractors installed steel-and-concrete coffer-



STRADDLE TRUCKS move girder from casting yard over rails on previously placed girders and into launching bridge.



Contractor concretes main river pier foundation.



Steel L-forms shape pier columns in 15-ft lifts.

dams to build the two river piers. The dams measure 31 ft by 106 ft and extend to the bedrock chalk, 64 ft below high water level. They drove steel sheetpiles around steel frames supported by steel bearing piles to form the cofferdams. Precast concrete panels divide each cofferdam into five cells.

Cranes and airlift pipes were used to excavate the riverbed above the chalk. They then plugged each cell with tremie concrete to a depth of 20 ft. The cells were dewatered, and the remainder of each reinforced concrete pier footing placed in the dry.

The contractor did some grouting of the chalk through vertical tubes embedded in the concrete and in contact with bedrock. The engineers are using the same tubes to measure any settlements that occur.

• **Steel forming**—The joint venturers are using advanced steel forming techniques not used previously in Britain to cast the girders, piers and bents. They will use sliding wood forms for construction of the cantilevers and anchor arms.

A stiff plate girder form is used for the pier bents. Largest of the bent girders weighs 430 tons, is 116 ft in over-all length, spans 64 ft between pier columns; it is 7 ft by 6 in. in cross section. The steel form itself weighs about 60 tons.

Tapered steel saddles on the pier columns support the bent form.

The hollow box girder is stiff enough to limit deflections during casting to very small values, on the order of $\frac{3}{8}$ in. maximum. The method eliminates the need for falsework and any use of retarder in the concrete. The contractors will use the same form for all the bents.

Steel forms for the pier columns comprise two adjustable L-shaped sections with a top and bottom ring; over-all height is 17 ft. The contractor casts each pier in 15-ft lifts. He uses the same form for each lift after cross-sectional adjustments are made to accommodate a 60 to 1 taper on two faces. The bottom ring supports a working platform, becomes the top ring in the succeeding lift. The contractor has two sets of pier forms, permitting work on a pair at the same time.

• **Prestressed concrete beams**—From eight to ten of the big post-tensioned beams go into each span of the approaches, depending on the width of the roadway.

Box beams on the outside provide torsional resistance to accommodate the roadway overhang; internal beams have I-sections. Beams will be cast in steel forms in yards on either bank. Forms for the outer faces of box beams are metallized by zinc spray.

The design called for precast end blocks—where prestressing loads are concentrated—to minimize shrinkage cracks by reducing the interval between casting and stressing. Beams are initially stressed the day after casting. The aggregate-cement ratio is 4:1; water-cement ratio is 0.39; and compressive strength, 9,000-10,000 psi.

• **Placing prestressed beams**—A triangular-truss launching bridge 215 ft long handles and places the prestressed beams in the approach spans.

At the casting yard, a pair of straddle bogies (one at each end) pick up a beam. The bogies travel on rails out of the yard and over previously placed beams to the span where the launching bridge is and where the beam is to be placed. One end of the launching bridge (trussed end) rests on the bent on the far side of the span; the other end extends backward into the preceding span and is supported by a wheeled frame (see sketch).

Each bogie has an upper, exterior set of wheels (see sketch). The exterior wheels engage flanges on the launching bridge in order to travel out over the

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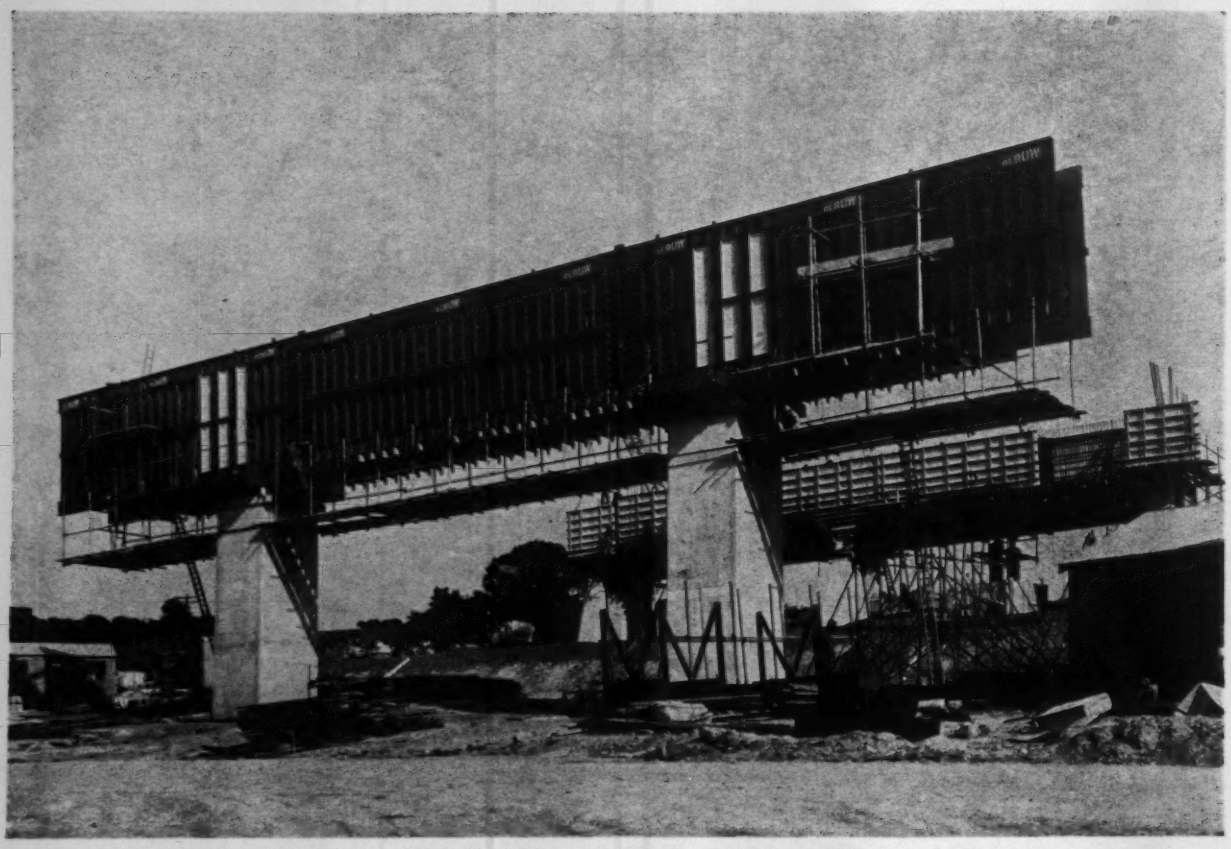

Box girder form spans 64 ft between pier columns to allow casting of bent girder.

open span. When the beam is in place, with one end over each bent, hydraulic jacks lower the beam to rest on the piers. The beam is then rolled transversely to its final position.

To launch the bridge over a new span, the contractor uses the first beam of that span as a counterweight. By maintaining equilibrium around the rear, wheeled support of the bridge, a crew can push the bridge out until the trussed support lands on the opposite pier. The bridge is then anchored in position.

The procedure described is being used on the west approach spans. The same launching bridge is used on the east side, but bogies are modified to permit rolling of the beams out at the level of the bents.

• **Deck construction**—After the prestressed beams are in place, the contractor casts a 9-in. reinforced concrete deck slab in place. Both the beams and the deck are simply supported at this stage.

Next step is to cast a transverse reinforced concrete diaphragm between the beam ends and the slab, over each pier. The diaphragm makes the beams continuous over the piers and helps stiffen the slab transversely. A group of 7-ft long prestressing cables join the beam ends and pass through the diaphragm to absorb stresses caused by pier settlement. Vertical loads are transmitted to the bents by rollers under the beam ends.

• **River spans**—First step in construction of the river spans is to cast a 20-ft long diaphragm over one of the river piers. The diaphragm, which extends 10 ft on either side of the pier center line, is cast in three vertical lifts.

The contractor casts the cantilevers in 10-ft-long sections the full height of the girders, simultaneously on the two sides of the diaphragm. The sections are continuously prestressed by 1¼-in. high strength alloy steel bars.

Crews use 150-ton hydraulic jacks to handle two sets of traveling wood forms suspended from the tops of the cantilevers. A pile-supported tower on the bank side of each river pier (under the anchor span) takes a small downward thrust during construction of the cantilevers. This procedure guarantees positive balance control, the reaction being measured by a hydraulic jack on the tower. The tower also supports a working platform during construction of the diaphragm over the pier.

When the anchor span extends 200 ft from the river pier, the contractor will erect another tower located about 150 ft from the pier, and remove the original one. Still another tower will be erected toward the shore as the anchor span is completed.

Final step will be to install the suspended center span, made up of prestressed beams, and cast the deck in place.

An alternative method of building the main river spans would have involved the use of piled falsework to cast the two cantilevers, the suspended span being floated into position. Complications and cost of handling river traffic made this alternative unworkable.

The cantilever method used had the advantage that prestressed beams for the suspended span could be fabricated by the use of the same forms as used for the approach beams, with the deck slab cast in place.

• **M-2 Motorway**—The start of construction on the bridge represented the beginning of construction of phased work on M-2, the most important highway in this region of England. Leaving the A-2 Motorway on the London side of Strood, the new route will bypass several small cities whose narrow streets now cause severe traffic congestion. Near Faversham, M-2 will rejoin an existing highway to Canterbury, Dover, Folkestone and other Kent coastal resorts.

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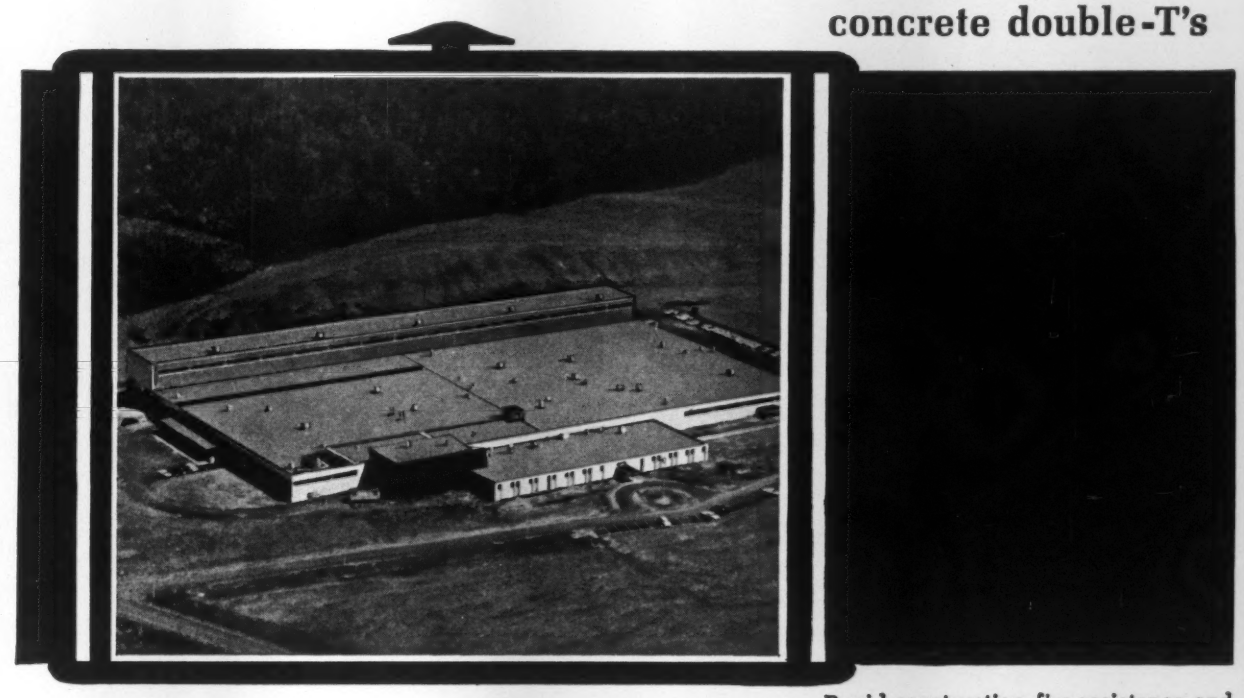
Places 20,000 sq ft of roof deck a day using prestressed concrete double-T's



Rapid construction, fire resistance, and spaciousness were the key factors in the choice of precast, prestressed concrete design for the new 250,000-sq ft Lynchburg Works of Delta Star Electric Division, H. K. Porter Company, Inc. Use of prefabricated concrete girders, beams, roof and floor units, and canopies helped meet a construction schedule of only eight months. On some days as much as 20,000 sq ft of double-T roof deck was erected.

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Lynchburg Works, Delta Star Electric Division, H.K. Porter Company, Inc., Lynchburg, Va. Owner: Lynchburg Area Development Corp.; Engineers: Hunting, Larsen & Dunnel, Pittsburgh; Associate Engineer: Garland M. Gay, Lynchburg; Engineers, Prestressed Structure: Hansen & Craig, Richmond; General Contractor: English Construction Co., Inc., Altavista, Va., Precast, Prestressed Units: Virginia Prestressed Concrete Co., Inc., Roanoke; Ready Mixed Concrete: Lynchburg Ready Mixed Concrete Co., Inc., Lynchburg; Concrete Blocks: Virginia Dunbrik Co., Inc., Lynchburg.

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Spring Scene...

with a hidden message for those who design, build and maintain busy streets

There's more to this picture of Washington, D.C. in early April than meets the eye. It's what you *don't* see that makes this scene so significant.

Paved streets in Washington is what this message is all about. Its purpose is to show you how *good* city streets or county roads can look after a hard winter . . . *before* the repair crews have gotten around. The reason you don't see gaping cracks, potholes and other types of roadway damage usually found after a long, hard winter is because over 600 miles of portland cement concrete street pavements in Washington (serving either as a concrete base for asphalt topping or conventional surface pavement) have been specified and built with welded wire fabric steel reinforcement.

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Welded Wire Fabric adds 30% more strength to concrete pavement slabs. This is achieved because the steel reinforcement distributes the load transfer and reduces stresses in the slab by about 30%, thus diminishing the pavement's tendency to develop cracks, and prevents the progressive opening of any cracks which do occur. Reinforced pavements provide a safe, smooth riding surface that lasts.

Today USS American Welded Wire Fabric is stronger than ever. Minimum tensile strength is now 75,000 psi. Minimum yield strength is 60,000 psi. A 100% machine-fabricated product—ready for immediate placement—it is available in weights, gauges and dimensions to your exact specifications. For more information, contact our nearest Sales Office, or write direct to American Steel and Wire, Room 1275, Rockefeller Building, Cleveland 13, Ohio.

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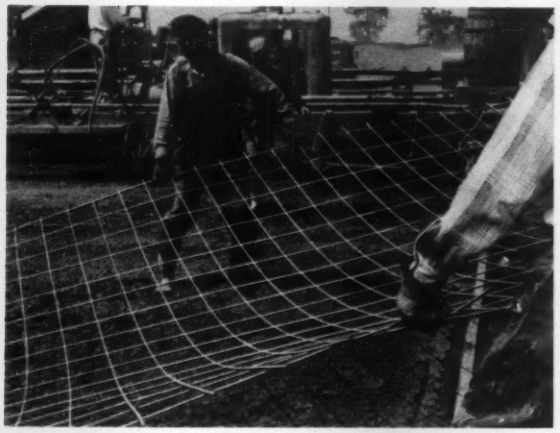

Workers place sheet of 50-lb. welded wire fabric on a freshly poured concrete base which will later be topped with asphalt.

American Steel and Wire Division of United States Steel

USS

ON GUARD IN INDEPENDENCE SQUARE

About 75 feet away from Independence Hall, in the park to the south, stand R. D. Wood Hydrants like sentinels on duty. While their proximity to the Nation's most revered historic monument does not necessarily imply endorsement, we nevertheless like to think of them there, on guard night and day against the fire that could destroy what Gen. Howe saw fit to spare, and Clinton too, in the British occupation. But R. D. Wood Hydrants need no endorsement. For over a century they have shown themselves to be in constant readiness for any emergency. Of simple, ingenious design and rugged construction, R. D. Wood Hydrants are protected against ice and sediment—function smoothly when the engines arrive. There could be no better protection for any community than R. D. Wood Hydrants—and there could be no better protection for the birthplace of the U.S.A.

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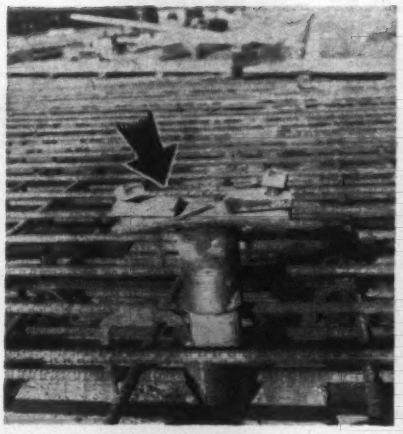
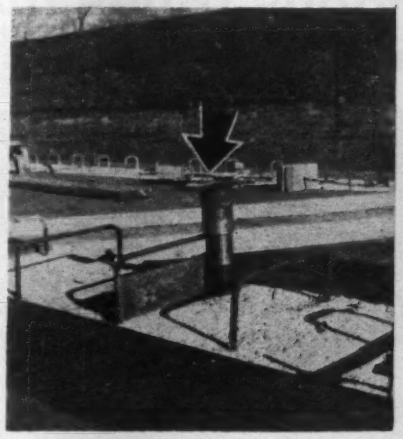
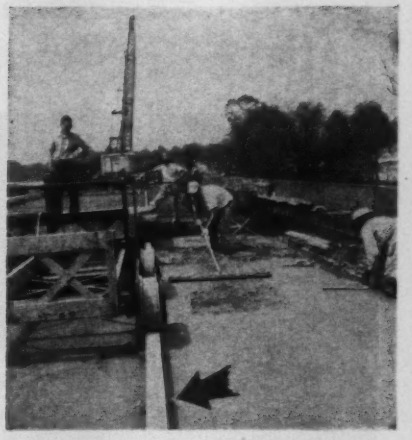


Threaded pipes welded to rebars . . .



or steel plates support caps and . . .



rails on which finisher travels.

Pipe Sections Speed Bridge Deck Paving

Simple, threaded pipe supports for the rails on which a bridge deck finisher traveled proved a boon to the contractor on the first section of the $300-million Delaware Expressway in Pennsylvania.

Booth and Flinn, Inc., Pittsburgh, built a 2.8-mile section of the six-lane expressway, including several major structures. Structures included two pairs of alternate-type-superstructure bridges, one pair of reinforced concrete rigid frame bridges and one pair of steel plate girder structures.

The alternate-type-superstructures were designed in steel, but the contractor had the option of using prestressed concrete. This he chose to do.

The Pennsylvania Department of Highways specified composite deck construction with a ½-in.-thick integral concrete wearing surface. Deck construction specifications required the use of a retarder admixture in sufficient quantity that the concrete could be vibrated, worked and finished within a period of at least 3 hours after placing, but not more than 5 hours. The contractor used Plastiment for this purpose.

Temporary rails supported the power-driven deck finishing machine. Specification requirements for this phase of the work included vertical supports for the rails that were fixed, but adjustable; spaced to limit deflections to not more than ⅛ in. in 10 ft; erected on structural members; and that could be removed to a depth of at least 2 in. below the surface of the concrete with a minimum of disturbance to the concrete.

The contractor provided rigid support for the rails by welding 3-in. threaded pipe sections either to the shear reinforcing of the prestressed beams or to the top flanges of the steel stringers. Since the rails followed the horizontal curvature of the deck, welders attached some of the pipe sections to steel plates, which in turn were welded to the shear reinforcing of the beams.

Workmen screwed on special metal caps fitted with bolts and clips to anchor the rails. Setting the cap at the exact elevation required was simple, since a halfturn moved the cap up or down ⅛ in. After the finishing machine completed a section of the deck, workmen loosened the bolts and removed the rails; caps were removed and re-used. Pipe sections were left behind and grouted.

Ready-mix trucks dumped concrete into a 2-cu-yd bucket, which was lifted by a crane and unloaded into a hopper. The hopper loaded a fleet of motorized buggies, which dumped from a hand propelled platform that rode on the same rails as the finishing machine.

Behind the platform, a single-screed finishing machine made two passes over the 38-ft wide deck. The remaining portions of shoulder and curb decking were screeded manually at the same time. Final operations included longitudinal hand floating from a movable platform and burlap belting.

K. Yervant Terzian, chief structural engineer of Urban Engineers, Inc. of Philadelphia, prepared the plans and specifications for the project. K. H. Jensen is bridge engineer for the Pennsylvania Department of Highways. J. Scott was superintendent for the contractor.

Coated Wall Cuts Down on Dust

An unusual coated asbestos wall has helped a manufacturer achieve a dust-free atmosphere required for the production of precision, energy-absorbing devices at his plant in North Tonawanda, N. Y.

Electrostatic air cleaning and close temperature and humidity control produces the dust-free atmosphere in the windowless building.

The wall panels have 2-in. styrofoam insulation sandwiched between two faces of mineral-enameled cement asbestos board. The mineral-coated board helps preserve the clean air because its surface is almost electrostatically inert and thus does not attract charged dust particles. Abrasion resistance and easily cleaned surfaces also help.

Teak mullions were selected because of their superior insulating qualities and lower thermal expansion coefficient, which promised to maintain sealed construction better than metal mullions.

Performance has exceeded expectations, says Paul H. Taylor, president of Taylor Devices, the owner. The new wall panel has achieved minimum thermal expansion, maximum insulation, maximum airtightness at the mullion joints. Heating fuel consumption has been only one-third that forecast.

The wall panel skin is Glasweld, made by U. S. Plywood Corp.

Mirrors, rectangles, and other tremendous trifles make **Shone**® your bargain buy in sewage ejectors

When 91 years of engineering and experience go into a **sewage pumping device,** there can be only one result—an ejector that is so much in a class by itself, it becomes an "institution" . . . a piece of equipment that keeps other ways of handling sewage **perennially obsolete** . . . a mechanism that makes embarrassing service interruptions and dangerous climbing in-and-out of manholes things of the past. Each part, each material, each contour, each surface of the Shone ejector has significance in the vital job of handling sewage.

1. Consider the **mirror-like** "superfinish" (you can **actually shave** in it) surfaces of the pilot valve slides and seat of the Shone's exclusive control system. Hand-lapped to perfection . . . only the weight of the valve slide plus pilot air pressure maintain the seal for decades of operation. Faces of the two parts fit so accurately that it is actually difficult to pull them apart. There is no leakage . . . opening and closing are truly positive. Parts do not wear "out of balance," because they are "broken in" before leaving the factory.

2. Piston valve and **pistons** are also "superfinished" to the same mirror-like surface . . . and a test of **each** valve assembly assures operation at only 60% of the **minimum** allowable pilot and operating pressure.

3. Or consider the singularity of **rectangular** valves in round pipes. Sticks and stones in sewage may "bridge" in a round pipe under low-flow conditions. Not only are the Shone's valves rectangular, but they have a larger internal cross section than the pipes to which they are connected. This is one of several reasons why **nothing** (but nothing) can choke a Shone ejector in this "bottleneck" spot. Anything which reaches the receiver passes through it and through the discharge valve.

4. We all know cotter pins are fine on tricycles (and on **external** linkage), but not inside pneumatic ejector inlet and discharge valves. You can't find a more perfect snagger for rags and other strangulating debris. Shone has flush-driven pins on valve hinges, another tremendous trifle.

5. A newly-cast, iron receiver, like any good whiskey, needs to be aged. Receivers for Shone pneumatic ejectors are "mellowed" for up to one year. This settles them down, prevents cracks and warping by relieving internal stresses in the crystal structure. Remember that Shone sewage ejector installations are usually considered permanent — the **first U. S. installation, 1889, is still in service.** An important invisible extra!

6. There are no "missing links" in the control linkage assembly of a Shone ejector. **Each** assembly is set, tested, dowled, and "match-marked" for its **own** particular receiver assembly. No trial and error fitting on the job. Another Shone "intangible" **asset.**

7. Tipsy control rods are obviously going to be less than 100% efficient. Shone bell rods are sober, straight, and only work with or against the forces of the bells and gravity. There is **no** side thrust to deform the packing seal. A trifle? No, a reason why Shone packing boxes go **years** without repacking.

8. Today, nothing is truer than "time is money." A special cast iron header, job tailored for each unit, holds field fitting, pipe cutting, etc., to bare necessities. Duplex units are complete with cross connections. The installer spends his time installing!

Would you like to hear more about how these and other design subtleties which make Shone the startling bargain in ***sewage*** *pumping equipment? Call your Yeomans representative. He's in the Yellow Pages.*

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New Twist In Conveyor Belts

A new conveyor belt twists a half turn on its return trip to prevent its sticky side from touching idlers and pulleys. It prevents residues that build up on the belts carrying surface from clogging and damaging the conveyor's moving parts.

Two twist pulleys are placed at each end of the belt flight. After the belt delivers its load and doubles back for the return, it makes a 180-deg twist to present a clean face to the idlers. At the loading end, it rights itself with another 180-deg twist before accepting the new load.

According to the maker, the turnover system can be applied to any conventional conveyor system now in operation. All that's needed is space enough for the belt to turn in and space for mounting the turnover pulleys. B. F. Goodrich Co., Akron, Ohio.

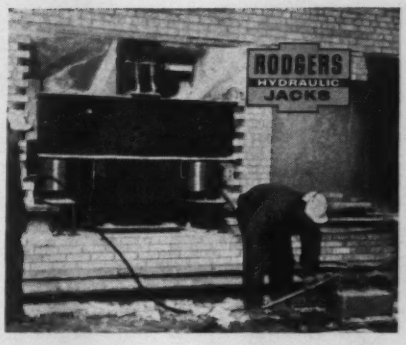
Machine Makes Friction Weld

American Machine and Foundry Co. has a prototype friction-welding machine. Friction welding consists of holding one object still while a second is rotated at high speeds and pressed against the first. After a specified period of time, the machine abruptly stops rotating, pressure is increased, and the two objects are held still for a specified period.

To weld high-alloy to low-carbon steel, for example, the rotating element spins at about 12,000 rpm. The rotating section contacts the static section and pressure is gradually built up. The rotating action increases the temperature and metal at the point of contact becomes molten. Rotation is stopped as rapidly as possible and pressure is quickly increased and held long enough to complete the weld, according to the manufacturer.

AMF claims that the new method can weld a wide range of different materials to each other: copper to brass, brass to aluminum, and aluminum to steel.

Recently, the company used friction welding to fill an industrial order. Some 1,000 welds were made on the prototype machine in welding male and female tool joints (1.750 in. in dia). Cost data carefully compiled during the production run indicate that the new friction welded joint is competitive with threaded and coupled joints and with pressure welded joints. About 20 welds per hour were made. American Machine and Foundry Co., 261 Madison Avenue, New York 16, N. Y.



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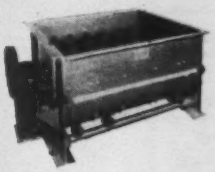

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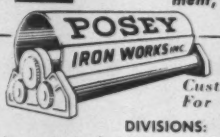

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Court Allows Oral Evidence

Parol evidence is admissible to determine the real meaning of a contract if the contract is ambiguous.

The rule was applied by a Connecticut court in a case involving a plumbing subcontract. The question was whether the plumbing contractor should install a sprinkler system as part of the contract price or be paid for its installation as extra work.

The subcontract covered the labor and material for the plumbing work, including installation of a sprinkler system, for a school project in Greenwich, Conn.

An addendum to the contract provided that the sprinkler system would be eliminated if certain fireproof protection was installed. Although the fireproofing was installed, the Board of Education insisted on a sprinkler system, too.

The plumbing contractor claimed that his subcontract was supplemented by an oral agreement with the general contractor. Under that agreement, he said, the general contractor was to seek payment for the sprinkler system as extra work and was to turn the payment over to the subcontractor.

The general contractor was paid for installing the sprinkler system as extra work but refused to pay the subcontractor. He contended that the written subcontract called for the installation of the sprinkler system. The subcontractor brought an action to recover and obtained a judgment. The judgment was affirmed on appeal.[1]

The general contractor's appeal was based mainly on the fact that the trial court allowed evidence of the plaintiff's claim that he would be paid for the installation of the sprinkler system as extra work in spite of the fact that the subcontract specifically called for installation of that system.

The appellate court stated: "Not only the general contract but also the plans and specifications, together with the addenda, became a part of the subcontract between the parties. Batter Building Materials Co. v. Kirschner, 142 Conn. 1, 5, 110 A. 2d 464; Geary v. New Haven, 76 Conn. 84, 90, 55 A. 584. Plans and specifications show what a building contract really is. Cruthers v. Donahue, 85 Conn. 629, 631, 84 A. 322.

As the subcontract itself included the sprinkler system, whereas alternate 32, which became a part of the general contract incorporated into the subcontract, excluded it, the subcontract in its terms presented not only an ambiguity but an inconsistency which amounted to a contradiction. It was therefore competent for the court to admit parol evidence of the conversations between the parties prior to the execution of the subcontract as an aid in its interpretation and in the ascertainment of the intent of the parties as expressed in it. (Citing many cases.)

There was no error in admitting the testimony of A. P. Mazza, president of plaintiff, concerning conversations which he had with Alfred F. Barbaresi, representing the defendent, between August 6, 1954, the date of the subcontract, and October 19, the date of its execution. These conversations tended to resolve the ambiguity in the subcontract by showing that Mazza signed it in behalf of the plaintiff in reliance on a promise by Barbaresi. That promise was that if plaintiff installed the sprinkler system the defendant would claim it as extra work and, if it was successful in collecting from the Board of Education for the system as an extra, the defendant would pay the plaintiff the bid price of $4500 which the plaintiff had submitted as an addition to its base bid under alternate 33.

The court did not err, furthermore, in admitting into evidence the change order of the architect allowing the defendant $11,047.13 for extras, including the sprinkler system at $4500, and other documents showing payment by the town of Greenwich to the defendant for the changes.

"The court apparently construed the subcontract in the light of the parol evidence as not requiring the plaintiff to install the sprinkler system as part of the performance necessary to be rendered to earn the price stipulated in the subcontract. Consequently, the written subcontract, to the extent that it did not show how payment for the sprinkler system, if one was installed, was to be made, was not the sole repository of the

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

final agreement between the parties, and the finding to that effect must stand.

Under the circumstances, it was competent for the parties to deal with the question of payment for the sprinkler system by a contemporaneous oral agreement. Harris v. Clinton, 142 Conn. 204, 210, 112 A. 2d 885. The court did not err in concluding that the oral agreement was enforceable and that under it the defendant was obligated to pay the plaintiff $4500 for the sprinkler system."

(1) Greenwich Plumbing & Heating Co. v. A. Barbaresi & Son, Inc., 164 A. 2d 405, Supreme Court of Errors of Connecticut, July 26, 1960.

Courts Use Various Tests For 'Satisfactory' Work

Contracts very often contain a provision to the effect that the work must be done to the satisfaction of one of the parties. There are certain limitations to such provisions.

This matter was discussed by the court[1] in a recent case, where the court stated: "Provisions in agreements calling for the performance to the satisfaction of a party fall into two general categories. In contracts relating to operative fitness, utility or marketability, the provision is construed as a matter of law as imposing only the requisite of satisfying a reasonable man (3 Williston, Contracts Section 675 A, 1946 (Rev. Ed.).

For example, such a construction has been given to 'satisfaction' provisions where the performance called for was the installation of machinery (Hummel v. Stern, 21 App. Div. 544, 48 N.Y.S. 528, affirmed 164 N.Y. 603, 58 N.E. 1088), and where repairs were to be made to a boiler (Duplex Safety Boiler Co. v. Garden, 101 N.Y. 387, 4 N.E. 749).

"On the other hand a literal construction of the 'satisfaction' provision is made where the agreements provide for performance involving 'fancy, taste, sensibility or judgment of the party for whose benefit it was made (10 N.Y. Jur., Contracts, Section 302, page 263). Such a result obtains in cases calling for performance to one's satisfaction in the making of a garment, the giving of a course of instruction, the services of an orchestra, the making of recordings by a singer and the painting of a portrait (see cases cited in 2 Clark, N.Y. Law of Contracts, Section 928, page 1319."

(1) Fursmidt v. Hotel Abbey Holding Corp., 200 N.Y.S. 2d 356, N.Y. Supreme Court, Appellate Division, May 10, 1960.

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P-7299, Engineering News-Record
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

Excavation prices take 27% of costs for . . . .

Virginia Highway and Bridge

A low unit price of $0.55 for 114,212 cu yd of "regular" excavation was the key to Lanford Bros.' Co., Inc., Roanoke, Va., low bid for this grading, paving, and bridge construction job in Bath County. At $236,447, the low was 12% under the second low, a joint venture of Clower & Michael, Romney, W. Va., and Buckley-Lages, Inc., Winchester, Va., and 31% under the high of five bidders. Excavation prices ranged from Lanford Bros.' low to a high of $0.80 a yard. R. C. Ambler, Staunton, Va., is the District Engineer on this job for the Department of Highways.

Also low with concrete prices, Lanford Bros. bid $65 a unit for 143 cu yd of class A concrete for highway construction, $15 under both the second and third low. At $55 a yard for 93 units of class B concrete, they were from $5 to $20 low. Similarly, with a low of $65 for 312.7 cu yd of class A for bridge superstructure, they were $15 under the second low, and $10 under the third. And with a low of $52 for 571.7 cu yd of class B for substructure, $8 under the second low and $3 under the third.

The new highway section, including the 150-ft long bridge, will be 4.4 miles long and will have a 16 ft, 2 in.-aggregate base. The bridge, over Back Creek, will have two 34-ft and two 42-ft concrete slab spans.

Wage rates include: carpenter, $2.90; common laborer, $1.58/hr, and bricklayer, $3.75/hr.

The bidding included:

1C	Lanford Bros. Co., Inc., Roanoke, Va.	$236,447
2	Clower & Michael, Romney, W. Va., & Buckley-Lages, Inc., Winchester, Va.	269,630
5	Echols Brothers, Inc., Staunton, Va.	341,115

Bids: 4-26-61 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$4,500	$7,500
Exc, regular	cy	114,212	0.55	0.80
Select mat, min CBR-20, max size 4"	cy	7,459	5.00	3.90
Conc cl A, AE	cy	143	65.00	80.00
cl B, AE	cy	93	55.00	60.00
Steel, reinf	lb	16,108	0.14	0.15
Pipe, underdrain	lf	680	2.00	2.00
Underdrain, comb	lf	218	2.00	2.00
Pipe, 1800, 12", 16ga	lf	428	3.00	3.50
2125, 15", 16ga	lf	1,092	4.00	4.00
2400, 18", 16ga	lf	236	5.00	4.50
3000, 24", 14ga	lf	72	6.00	7.00
5750, 30", 14ga	lf	182	8.00	8.00
6600, 36", 12ga	lf	54	12.00	12.00
8000, 48", 12ga	lf	204	20.00	18.50
10000, 60", 10ga	lf	80	25.00	25.00
CMP extension, 60", 10ga	lf	30	25.00	25.00
Riprap, conc slab	sy	56	10.00	10.00
Flume, paved	sy	39	10.00	10.00
Handrail	lf	21	4.00	5.00
Delineators, road edge	ea	11	5.00	6.00
Guard rail	lf	600	2.50	2.50
Truck hrs, allaying dust	hr	100	4.00	3.00
Markers, conc project	ea	2	15.00	10.00
Bri, exist, remove	ls	job	1,000	400.00
Aggr, crusher run, ¾" down	t	650	4.00	3.50
base crse, tp 1, gr C 2"	sy	44,752	0.45	0.40
Calcium chloride	t	39	80.00	70.00
Bids: 4-26-61 Items	Unit	Quantity	Unit Prices 1C	2
Removal, item 1	ls	job	50.00	1.00
2	ls	job	50.00	1.00
3	ls	job	50.00	1.00
4	ls	job	50.00	1.00
Superstructure, std concrete slab span, conc, cl A, AE	cy	312.7	65.00	80.00
steel, reinf	lb	58,580	0.14	0.13
Substructure, std concrete slab span, conc, cl B, AE	cy	571.7	52.00	60.00
steel, reinf	lb	5,280	0.15	0.15
Exc, str, cl A	cy	142	4.00	3.00
cl B	cy	748	8.00	12.00
Exist str, dismantle & remove	ls	job	1,500	1,000

ENR Constr. Cost Index (1913=100) 20-cities avg.—837.58

Concrete Underbids Steel For 2-Span Montana Bridge

Three bidders priced both prestressed concrete and steel H-beam alternates for this 114-ft Medicine River, Mont. Bridge. The Bureau of Indian Affairs contract went to the prestressed concrete for $38,100, $2,188 under the steel alternate. Walter Mackin & Son, Billings, Mont., was low by 3.3% under second low, W. P. Roscoe Co., Billings, and 6% under the high.

The two-span reinforced concrete structure will cross the river's south fork on the Blackfeet Indian Reservation. It will have H-beam piling abutments with reinforced concrete cap, a reinforced concrete pier on spread footings, and a reinforced concrete deck resting on the concrete girders. Class A concrete for the bridge has a compressive strength of 5,000 psi.

Wage rates include: general laborer (heavy construction), $2.54/hr; power equipment operators, $2.70-$3.24; carpenters, $3.30; cement masons, $3.35.

The bidding included:

1C	Walter Mackin & Son, Billings, Mont.	$38,100
2	W. P. Roscoe Co., Billings, Mont.	39,415
3	C. B. Lauch Const. Co., Great Falls, Mont.	40,513

Bids: 6-13-61 Items	Unit	Quantity	Unit Prices 1C	2
Alternate 1—Prestressed Concrete Structural Beams				
Excavation, str, bri	cy	75	$15.00	$30.00
Piles, str steel, furn	lf	235	6.00	6.00
drive	ea	10	75.00	90.00
Conc, cl A	cy	156	100.00	105.00
prestr str beams, 55'	ea	8	1,400	1,400
steel, reinf	lb	22,050	0.20	0.18
str, furn, fab, & erect	lb	1,551	0.75	0.70
bri railing	lf	222	11.00	10.00
Alternate 2—Steel Structural Beams				
Excavation, str, bri	cy	75	15.00	30.00
Piles, str steel, furn	lf	235	6.00	6.00
drive	ea	10	75.00	90.00
Conc, cl A	cy	154	100.00	105.00
Steel, reinf	lb	22,300	0.20	0.18
str, furn, fab & erect	lb	69,000	0.21	0.22
bri railing	lf	223	11.00	10.00

ENR Constr. Cost Index (1913=100) 20-cities avg.—850.38
ENR Building Cost Index (1913=100) 20-cities avg.—570.17

Labor and Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES.

- Cement Aggregate, Ready Mixed Concrete Asphalt: Last, Aug. 10; Next, Sep. 7.
- Wood Products, Glass, Explosives, Chemical: Last, Aug. 24; Next, Sep. 21.
- Iron & Steel Products, Pipe: Last, Aug. 17; Next, Sep. 14.

HOURLY WAGE RATES—Base rate + fringe benefits

Classification	Atlanta $ + ¢	Baltimore $ + ¢	Birmingham $ + ¢	Boston $ + ¢	Chicago $ + ¢	Cincinnati $ + ¢	Cleveland $ + ¢	Dallas $ + ¢	Denver $ + ¢	Detroit $ + ¢	Kansas City $ + ¢	Los Angeles $ + ¢	Minneapolis $ + ¢	New Orleans $ + ¢	New York $ + ¢	Philadelphia $ + ¢	Pittsburgh $ + ¢	St. Louis $ + ¢	San Francisco $ + ¢	Seattle $ + ¢	Montreal $ + ¢	Toronto $ + ¢
COMMON LABOR																						
Building	2.00	2.30+7½	1.95	2.90+10	3.225+7½	2.90	3.52	1.85	2.47	3.00+34	2.705	3.26+10	3.00	1.925	3.65+292	2.70+15	2.85+20	3.025+10	3.225+10	3.00+25	1.75+4	2.05+8
Heavy Const.	2.00	2.30+7½	2.05	2.75+10	3.225+7½	3.025	3.435	1.85	2.42	3.00+34	2.755	3.26+10	2.98	2.00	3.65+292	2.70+15	2.55+20	3.025+10	3.225+10	3.00+25	1.75+4	2.00+8
SKILLED BUILDING TRADES																						
Bricklayers	4.00	4.10+15	4.05	4.20+30	4.40+10	4.125+14	4.085+25	4.15	4.15	4.09+33	4.20	4.35+25	4.025+15	3.775+7½	5.20+62	4.40+17	4.60+20	4.25+33	4.40+42½	4.30+30	2.55+6	3.20+13
Carpenters	3.35	3.725+7½	3.23	3.85+10	4.08+20	3.95	4.11+15	3.55	3.89	3.75+47	3.75	4.00+20	3.68+15	3.35+075	4.75+38	4.00+20	4.225+20	3.975+104	3.95+36	3.53+20	2.35+5	2.95+12
Struct. Iron Workers	3.70+7½	4.10+20	3.77+13	4.26+20	4.55+16	4.025+105	4.16+10	3.675+8	3.81+10	4.10+27½	3.90	4.50+3.55	3.77+15	3.65+10	5.05+706	4.60+23	4.50	3.975+104	4.50+35	3.92+10	2.55+6	3.05+12
Plasterers	3.50+3	3.85+10	3.37	4.00+45	4.17+27	3.925+1	4.16+10	3.875+10	3.975+15	3.87+41	4.00	4.25+55	3.77+33	3.34+5	4.95+67	4.30+20A	4.325+20	4.10+7½	4.29+63	3.87+32	2.65+6	3.20+21
Electrical Workers	4.00+5	3.85+10	3.925	4.10+25	4.50	4.09+51	4.29	3.625+7½	4.20	4.11+52	3.90+43	4.65+46	3.85+44	4.00+7½	4.40+26	4.525+18	4.60+34½	4.26+52	4.38+37	4.025+26	2.55+5	3.60+19
Steamfitters	4.00+25	3.96+18	3.80+12	4.15+29	4.25+25	4.10+215	4.06+20	3.825+11	4.05+12	3.90+51	4.00+295	4.58+68	3.77+38	3.90+7½	4.80+772	4.35+32	4.25+20	4.425+25½	4.57+76	4.14+29	2.62+6	3.51+20
EQUIPMENT OPERATORS																						
Hoisting Engineers	3.88	4.10+20	3.30	4.15+35	4.05+05	3.90A	4.26	3.65	3.40	3.74+39½	3.72	4.01+25	3.75	3.475+7½	4.90+39	4.50/4.205 +275A	3.82+20	4.175	4.00+35	3.94+20	2.35+5C	3.25+13
Tractor Operators (B)																						
34-49 hp	3.15	3.70+20	3.30	3.575+35	3.80+5	3.675+10	4.01	2.625	2.65	3.74+39½	3.025	4.31+25	3.36	3.475+7½	4.375+35	3.78+275	3.82+20	4.175	4.23+35	3.91+30	1.95+4C	2.50+10
70-100 hp	3.15	3.70+20	3.30	3.575+35	3.95+5	3.675+10	4.01	2.625	3.25	3.74+39½	3.475	4.31+25	3.60	3.475+7½	4.375+35	4.03+275	3.82+20	4.175	4.23+35	3.91+30	2.18+5	2.60+10
Over 100 hp	3.15	3.70+20	3.30	3.575+35	3.85+5	3.675+10	4.01	2.625	3.25	3.74+39½	3.475	4.31+25	.....	3.475+7½	4.375+35	4.03+275	3.82+20	4.175	4.23+35	3.91+30	2.18+5	2.60+10
Tractor Scraper, 15-16 cy	3.15	3.70+20	3.30	3.575+35	3.85+25	3.675+10	4.01	2.625	3.25	3.74+39½	3.475	4.41+25	3.60	3.475+7½	4.50+36	4.03+275	3.82+20C	4.175	4.36+35	3.91+30	2.18+5C	2.60+10
Power cranes & shovels																						
½ cy	3.675	4.10+20	3.30	4.00+35	4.40+5	3.675+10	4.16	3.425	3.40	3.74+39½	3.72	4.41+25	3.82	3.475+7½	5.25+420	4.50+275	4.02+20	4.175	4.67+35	4.28+30	2.45+5	3.10+12
¾ cy	3.675	4.10+20	3.30	4.00+35	4.40+5	3.90+10	4.16	3.425	3.40	3.74+39½	3.72	4.41+25	4.08	3.475+7½	5.25+420	4.50+275	4.02+20	4.175	4.67+35	4.28+30	2.45+5C	3.25+13
Motor grader operator	3.15	3.25+20	3.30	4.00+35	3.85+5	3.90+10	4.01	2.625	3.25	3.74+39½	3.72	4.41+25	3.36	3.475+7½	4.50	3.93+275	4.02+20	4.175	4.44+35	4.00+30	2.18+5C	2.90+11
Air Comp. operator	2.825	3.30+20	2.89	3.55+35	3.70+5	3.90+10	3.91	2.10	3.25	3.74+39½	3.475	3.53+25	3.25	2.75+7½	4.50+35	3.63+275	3.53+20	3.625	3.67+35	3.64+30	2.05+5	2.60+10
Air tool operator	2.22	2.325+7½C	2.15	2.80+10	4.00+5	3.90+10	3.885	2.10	2.75	3.13+34	2.80	3.47+10	3.30	2.075	4.10+492	2.70+10	2.825+20	3.625	3.655+10	3.35+10	2.05+5	2.60+10
TRUCK DRIVERS																						
1½ Ton	2.10	2.27+075	2.00	2.85+23	2.68+21	2.70+11	3.07+15	2.625	2.70	3.11+18	2.68	3.575+10	2.98	3.475+7½	3.275+28	2.82+18	2.75+20C	3.03+15	3.38+21	3.50+30	1.75+4	2.05+15
Under 4 cy	2.20	2.27+075	2.20	2.85+23	2.68+21	2.75+11	3.07+15	2.625	2.85	3.11+18	2.68	3.575+10	2.98	3.475+7½	3.275+28	2.82+18	2.735+30	3.23+15	3.253+21	3.50+30	1.75+4	2.05+15
Over 4 cy	2.50	2.27+075	2.45	2.85+23	2.68+21	2.80+11	3.07+15	2.625	3.05	3.11+18	2.755	3.765+10	3.13	3.475+7½	3.275+28	2.82+18	2.835+20	3.33+15	3.413+21	3.70+30	1.75+4	2.05+15

ENR Skilled Labor Average (Bricklayers, Carpenters, Iron Workers): $4.178, ENR Common Labor Average $2.826 Description of fringe benefits last appeared Sept. 22 1960. *A 2 drum. *B Including Bulldozers *C correction

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles Q	Minneapolis F	New Orleans	New York	Philadelphia H	Pittsburgh	St. Louis HO	San Francisco	Seattle	Montreal	Toronto
GYPSUM BOARD & LATH																						
Plaster board, ½"	$62.50F	$54.00	$63.00H	$61.00mH	$67.50	$53.50wH	$64.00CF	$57.50	$64.50H	$66.00K	$72.00H	$67.00F	$68.00	$57.00H	$70.00H	$54.00	$74.00K	$56.50/67.50	$60.00	$74.25K	$58.00M	$58.00
" " ⅝"	52.50F	47.50	52.00H	51.00mH	54.50	43.85wH	57.50CF	47.50	54.00H	56.00K	62.00H	61.50F	58.00	48.00H	55.00H	45.00	65.00K	51–56HO	49.00F	62.00K	50.00M	52.00
Board lath, ⅜"	40.00F	35.75	47.77H	36.00mH	45.00	33.05wH	40.00CF	43.50	42.00H	42.45K	45.00H	0.34F	0.41xL	40.00H	42.50H	36.50	40.00K	40.00HO	0.36xF	54.00K	39/42.00M	41.00L
SHEATHING																						
Gypsum T & G, ½"	62.50F	55.70	75.00H	56.00mH	62.50	51.16wH	53.75CF	57.50	66.75H	66.00K	.....	64.50F	67.00	57.00H	60.00H	52.50	63.00K	67.00HO	61.00F	73.00K	54.00M	70.00
Fiber board, ½", sq. e.	72.00F	65.00	67.50H	65.00H	87.00	65.00wH	72.50CF	68.75	62.50H	57.00DK	75.00H	75.00F	100.00	67.00H	78.00	62.50	60.00K	65–75HO	70.00F	68.50K	63.00M	65.00T
" " 25/32", T & G	.....	108.50	140.50H	120.00H	123.00	125.00wH	115.00CF	118.00	107.50H	89.18DK	122.00H	125.00F	135.00	140.00H	124.00	110.00	100.00K	115/120	111.00F	68.50K	.....	.....
INSULATION																						
Fiber board, sq. e., ½"	75.00F	69.00	83.50H	79.00hnH	87.00	72.50wH	80.00CF	68.75	75.00	62.50DK	80.00H	80.00F	81.00	80.00H	78.00	65.00	60.00K	75/80	69.00F	71.00K	73.00M	75.50T
Min. wool, loose	1.59z	1.40F	1.40	1.70bH	1.85	1.45wH	1.35	2.00	1.55b	1.30b	1.40H	76.00BeF	1.75y	2.25L	1.55b	1.20	1.25sK	125/135	1.75F	1.25tK	1.35M	1.85
" " 3" batts	67.80F	67.50	70.00	75.00H	80.00	60.00wH	70H	70.00	65.00ub	52.00	75.00H	83.00F	70.00	70.00*	68.50k	50.00	55.00K	60/70	66.50F	58.00K	60.00M	61.00
Glass fiber, loose	1.45	1.60F	2.00	.....	.....	1.45wH	.....	1.75	2.00b	1.85b	1.80H	1.35s	1.75	.....	.....	1.40	1.25sk	2.02P	1.75F	1.85*pK	1.35M	.....
" " 3" batts	50.00F	47.00F	65.00	75.00H	63/65	60.00wH	61.00	70.67	65.00a	80.00	75.00H	64.00	70.00	.....	68.50	50.00	55.00K	68.50	66.50F	50.25*lKh	60.00M	61.00
Aluminum foil, 1 side	3.75qi	4.00F	3.77gG	5.30xHS	5.25	3.02jwJ	14.00ioJ	5.00gAG	5.25	.....	3.60d	4.40g	3.50	6.50	4.38iH	2.90	4.25igK	4.39ig	5.10	3.50K	9.00qM	15.50o
" " 2 layers	.....	33.50F	.....	53.50qH		66.00wJ	55.00J	45.00	48.65	.....	60.00	7.45V	.....	.....	40.00cH	83.50	38.50K	.....	60.00F	45.00EK	56.00M	46.00

** F.o.b. warehouse. *a Semi thick. *b 30# bag. *c 3 layers of foil; $54.50. *d 40# kraft paper, 5 Msf, 100/500 rolls. *e 20# sq ft bag, 4" thick. *f Full trailer loads. *g 80# kraft paper backing 400 rolls or over. *h LCL. *i 40#. *j 80#. *k 2-in. *l 2". *m 8 to 10 ton quantities. *n Distributor's siding. *o Per Msf roll. *p 32# bag. *q 500 sf. *s 35# bag. *t 26# bag. *u Flame proof $75. *v 5000 sf quantity. *w F.o.b. city. *x Sq. yd. *y 30# bag. *z Spun rock wool. *A 650 sf. *B ton *C F.o.b. plant, freight allowed. *D CL. *E 10 Msf. *F Less 2% disc, 10th. cash. *L 5% disc, 10th mo. *M fed. tax incl. *N 1% disc, 10 days. *O add 2% sales tax. *P 50 lb. bags. *Q add 4% sales tax *R revised. *S 45 lb. *T less 2% 30 days. *U lots of 2606 sq. ft. *V 250 sf roll. *G ½ of 1% 10 days. *H 2% disc, 10 days. *J 1% disc, 10 days. *K Less 2% for

MEXICO CITY WAGES AND PRICES, AUGUST, 1961

WAGES, av per week, 8 hr day (pesos) 6 days work-extra day's pay

Common labor, building (peons)		101.50
	heavy const (peons)	136.50
Skilled labor;	carpenters 1 cl	210.00
	bricklayers 1 cl	245.00
	struct, ironworkers	315.00

MATERIAL PRICES, F.o.b. City (pesos)

Struct. steel shapes, fob Monterrey		
I-beams, 3 x 3 x 4"	per metric ton	1942.10
Reinf. steel, corrugated rods, per ton		
⅜"-½" x 11 meters consolidada		1875-1950
¾"-1" x 11 meters		1750.00

Gravel, truckload, per cu meter		
Blue gravel		30.00
Cement, std. port. (Tolteca)	per metric ton	260.00
Lumber, 2" x 4" 1st class pine 20 ft	per M sq. ft.	3000.00
2" x 4" 2nd class pine	per M sq. ft.	2300.00

Materials Prices

Monthly Market Quotations By ENR Field Reporters

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- Iron & Steel Products, Pipe: Last, Aug. 17; Next, Sep. 14.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, Aug. 10; Next, Sep. 7.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
STRUCTURAL CLAY TILE																							
partition-scored																							
3x12x12 in.	M	$154.95pe	$217.00	$135.00pss	$232.00†	$137.00ll	$179.00mmjvv	$205.00ff	$162.00	$170.00	$257.00	$158.00 r	$218.00pp	$178.00	$236.00wwh	$263.00ss	$200.00t	$180.00mmpp	$156.85*	$235.00pt	$168.78uqoo	$169.00rr
4x12x12 in.	"	154.95pkke	231.00	152.00pss	248.00†mm	149.00ll	190.00mmjvv	219.00ff	162.00—185.00		274.00	158.00 r	225.00pe	178.00	315.00wwh	281.00ss	213.00t	199.00pp	177.10*	270.00pt	180.93auqoo	185.50rr
8x12x12 in.	"	309.90pe	434.00	.....	463.25†mm	280.00ll	355.00jddmm	410.00	318.75	310.00	514.00	312.00 r	452.00pe	371.25	378.00wwch	527.00ssxx	400.00t	380.00pp	235.30dd	490.00pt	325.00ausqoo	360.00rr
Load Bearing—Scored																							
8x12x12 in.	"	387.40pe	491.00	303.00p	556.00†mm	.....	390.00jmmvv	465.00ff	387.75	310.00	582.00	312.00 r	225.00pw	371.25	384.00wwhn	597.00ss	453.00t	410.00pp	159.40qq	265.00pwt	220.00qoo	281.50rr
10x12x12 in.	"	.....	602.00	376.00p	.....	.....	422.00jmmvv	.....	472.50	390.00	767.00	400.00 r	.....	.....	.....	.....	607.00t	440.00pp	.....	.....	400.00qoo	405.00rr
12x12x12 in.	"	.....	690.00	465.00p	.....	.....	500.00jmmvv	709.00ff	385.00	442.00	876.00	500.00 r	.....	.....	.....	.....	693.00t	621.50pp	.....	.....	.....	506.00
BRICK, common backing	"	33.25uu	36.00	27.00ll	43.50p	32.00	50.00jk	44.00tt	32.00	35.00xx	53.50pmm	34.00	$42.00uu	49.50vxe	42.00	46.00p	40.00mm	42.00t	44.00mmpp	43.00*	57.00t	48.25bll	25.00rr
Straight hard	"	33.25uu	41.00	38.00jj	58.00p	34.00	49.00jk	48.00ggtt	53.00	54.00	54.00pmm	34.00	44.00	58.00vxe	55.00	.....	45.00mm	40.00t	45.50pp	43.00*	71.00t	56.30bll	60.00rr
LIME, in paper, Hyd. fin.	ton	42.50hh	35.80	38.28mm	42.00§	1.00aall	29.20jmm	32.75ptt	38.36	48.00p	38.00mm	36.26	38.00nnll	50.00bxe	48.00p	40.00p	40.00mmp	30.00t	1.00aapp	29.24	52.00bbt	39.00	34.00mm
" " Com hyd.	"	35.50hh	23.40	20.87mm	34.00§	0.90alaa	29.20jmm	28.00ptt	23.32	44.00p	30.00mm	34.26	38.00nnll	40.00bxe	32.00p	38.00p	24.50	26.00t	0.80aapp	29.24	38.00bbt	22.00	36.40mm
" " pulverized	"	.....	.....	26.33gmm	.....	.....	29.20jmm	.....	26.00	46.00p	40.00mm	29.76	39.00nnll	52.00bbde	.....	.....	27.50	34.00t	1.35zaapp	31.74	1.30mbbt	13.25	34.75mm

*§ F.o.b. yard. **F.o.b. plant Stockton. †f F.o.b. yard Roxbury. *a Smooth. *b $4.50 del. *c 8 x 12 x 12 in.-6 cell. *d Pulverized hot. *e less 5% disc., 10th. *f 8 x 8 x 12. *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C. *i 60 lb sacks. *j Truck load or over. *k $1.00 discount per M, 10 days. *m Per bb. 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra (6%). *r Not used: earthquake danger. *s 8 x 16 x 12. *t less 2% disc., cash. *u Inc., Federal tax. *v Sand lime. *w 5 x 8 x 12. *x dumped. *y Chi common. *z Pebble; 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 6 x 12 x 12. *ff 80% common. *gg Smooth. *hh less 2¢ disc., cash. *ii F.o.b. plant. *jj rough: smooth; $40. *kk 3½ x 11½ x 11½. *ll less 2% disc. 10th. *mm less 2%, 10 days. *nn F.o.b., L. A. *oo less 2%, 30 days. *pp add 2% sales tax. *qq 8 x 5½ x 11½. *rr 2½% disc., 10 days. *ss 5% disc., 10 days. *tt less 2% disc., 15th. *uu less 50¢/M, 10 days. *vv 4000 pcs. and over. *ww New manufactured in perodic instead of tunnel kiln.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

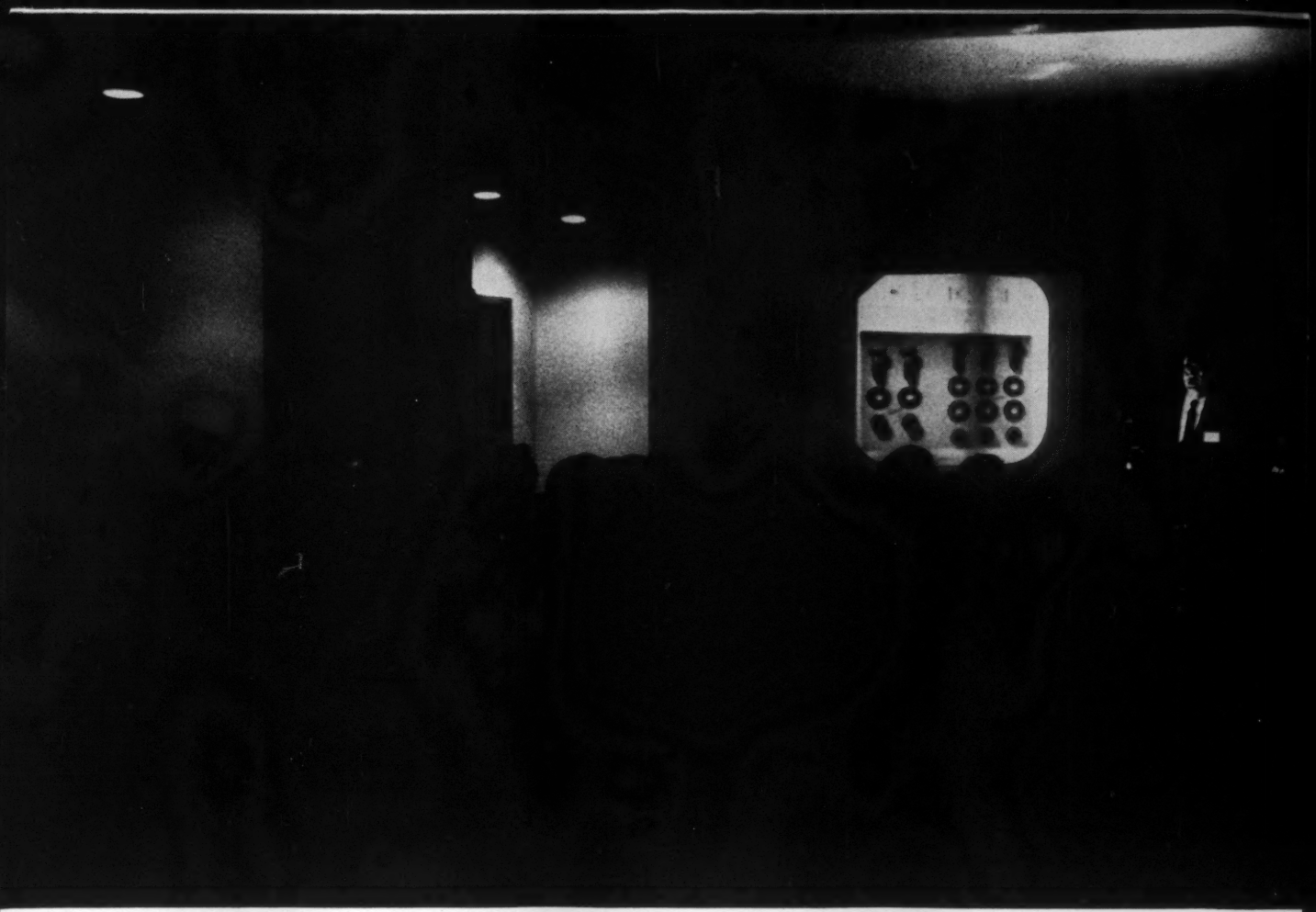
Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis K	San Francisco	Seattle	Montreal	Toronto
LEAD, red, dry	CWT	$14.75/15.10gg	JO$17.50pp	$26.00†J	$24.95†oomm	$15.25rjqqpp	$15.25†JO	$25.65†	$22.50	$23.85n	$15.95r	$33.15ggool	$16.25yy	$16.25N	$23.00Jpp	$14.75ocO	$14.75mmO	$21.50mggJ	$25.65†m	$26.70mm	$13.35HO	$19.45O	$14.95
White, in oil	"	24.00ggJ	24.00	29.00†J	26.90†mmm	24.00†J	24.00†J	26.90†	23.50M	24.00	24.00rr	28.55	22.00	21.50kk	24.00J	29.75	19.00mm	24.00J	26.90	26.90mm	24.00H	26.00wtt	21.65
READY-MIXED PAINT																							
Graphite b.	gal	....	3.00	3.90J	.....	.....	.....	.....	3.32ggP	.....	3.70	....mm	4.04	3.30	.....	.....	.....	3.35mm	2.20#EJ	.....	3.20mm	.....	5.52Dfft	5.15J
Aluminum	"	4.10	4.40	3.40J	.....	.....	.....	.....	3.64zzgg	3.25B	5.10	....mm	3.48	4.50n	.....	.....	.....	3.90mm	2.25#FJ	.....	4.30mm	4.19cefJ	6.55xff	6.18J
Ferric Oxide	"		3.50	.....	.....	.....	.....	.....	4.24qgg	.....	.....	....mm	3.06	4.20n	.....	.....	.....	3.65mm	2.25#GJ	.....	3.50mm	.....	5.10kfft	5.95J
ROOFING SUPPLIES	square	3.15kk	3.06	2.95†mm	3.55q	3.45ukk	2.99mm	2.85q	3.00u	2.94	2.85mm	3.21mm	3.40nkk	2.85kk	$2.78	2.99xx	.....	2.90sH	2.99iimm	2.87mm	3.34ccH	5.40	3.50
Rolls, slate surf.	CWT	2.30kk	3.67	2.17ii†mm	2.60q	2.75okk	2.20mm	2.10o	3.00o	2.25o	2.10ommll	2.68omm	2.40njkk	2.10hikk	1.98	2.20xxo	2.65	2.15sH	2.19hhK	1.72aaiimm	2.89hccH	4.65f	2.40aae
Asphalt felt	"	2.44	4.04	2.17ii†mm	3.04q	3.15okk	2.65omm	2.55o	3.00o	2.80o	2.55ommll	2.68omm	.....	2.55bikk	2.85	2.65o	2.55	2.15H	2.64hhK	2.59mm	.....	4.65f	2.40o
Asphalt coating	gal.	0.72kk	0.50	0.76ffmm	0.55q	48.00bbkk	0.56ymm	0.41y	0.47O	0.50ff	0.56ffmm	0.59y	0.75aykk	0.52ikk	0.68	0.52z	0.74	0.56H	0.50–0.55yK	0.46jj	0.66cc	1.60	0.70j
tar pitch	ton	49.00	54.00	48.00eemm	60.00q	57.70†kk	57.96Hmm	49.00gg	66.00hh	50.00	49.00mm	.....	s.....	50.00rkk	45.50	49.00*	49.00	55.00H	57.60K	54.00	.....	4.40uu	50.00A

*† Delivered. * Note: Red lead in oil 50% higher than white lead in oil. ** Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e Per 108 sf roll. *f Per 432 sq ft. *g F.o.b. yard Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *m 100 lb keg. *n F.o.b. city. *o Per 60 lb roll. *p 6-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-ga drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per 324 sf roll. *jj Asbestos roof coating. *kk less 2% disc., 10th. *mm less 2% disc., 10 days. *oo 100 lb bbls. *pp 50 or 100 lb bags. *qq 500 lbs or more. *rr F.o.b. plant, Detroit. *ss 50 lb bbls. *tt 25 lb kegs. *uu 250 lb bbls. *xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. *yy Sept. revised to $12.00. *zz Sept. revised to $2.80. *A 400 lb barrels. *B ASTM Spec. D962-49. *C 95%. *D Std. black. *J Milt. spec.: *E TTP27; *F TTY81; *G TTP31. *H less 2% disc., cash. *I Per 100 lb. *J less 1% disc., 10 days. *K add 2% sales tax. *L CL. *M 1 ton or more. *N under 500 lbs, add $1. *O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis uu	San Francisco	Seattle	Montreal	Toronto
PLASTER, neat	ton	$33.00ss	$24.00	$37.00ss	$26.00	$1.45bbtt	$24.95*ss	$29.00*ss	$32.80	$29.00	$28.00ss	$30.00	$28.00tt	$36.00F	$34.00	$27.00	$27.25	$31.00nn	$30.00	$29.50ss	$42.40nn	$22.60h	$50.00
gauging	"	45.00ss	35.70	43.00ss	30.00	1.45bbtt	24.95*	45.00N	35.60	29.00	28.00ss	35.00	29.00tt	36.00F	42.00	35.00	33.00ss	31.00nn	43.00	30.50ss	45.60nn	35.60h	30.00
VERMICULITE																							
Home insul. pellets	4 cf bag	1.65ss	0.95	1.55ss	1.40	1.55	1.75*ss	1.39ss	1.05	1.63	1.27ss	1.24E	1.25	1.65tt	1.38P	1.35	1.40ss	1.25nn	1.55	1.38ss	1.55nn	1.25h	1.47bf
plaster agg.	"	1.65ss	....	1.55ss	1.40	1.60	1.75*ss	1.34ss	1.21	1.40	1.31ss	1.26E	1.20ktt	1.80F	1.36P	1.38	1.25ss	1.30nn	1.60	1.38ss	1.35knn	1.40h	1.43bb
concrete agg. treated	"	1.85ss	....	1.60ss	1.40	1.60	1.85*ss	1.45ss	1.37	1.50l	1.40ss	1.34E	1.45	1.95Fl	1.42P	1.50	1.45ss	1.40mm	1.65	1.50ss	1.85lnn	1.60h	1.66bb
PERLITE, plaster agg.	"	1.65ss	1.15	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.21	1.50ss	1.45kii	1.26	1.16	1.40S	1.15P	1.45	1.05ss	1.40nn	1.55	1.38oss	1.50k	1.15v	1.14Q
concrete agg. untreat.	"	1.65ss	1.55	1.27ssl	1.55ss	1.60	1.75ss	1.45ss	1.32	1.60ss	1.50kii	.....	1.26	1.50S	1.25P	1.40	1.05qqss	1.40nn	1.60	1.58oss	.....	1.15v	.....
BUILDING SHEET																							
Alum. flat, .100"	lb	0.469noo	0.462	0.459M	0.474	0.564x	0.469	0.459aa	0.469	0.479	0.469a	0.469	0.459	0.469	0.469	0.489aT	0.479	0.475	0.479	0.575	0.50D	43.95AH	0.4375
corr. roof, .032"	sheet	9.67nY	0.451r	9.66K	25.07AAp	33.43p	9.35	25.07p	0.484	10.89	9.35a	26.74ggyyp	8.77Z	10.09	33.43	0.2507aXAA	8.86	10.39	9.18	10.83	11.25D	12.10H	26.00ap
Stainless steel, 20 ga.	CWT	61.25nxx	63.00	64.50K	62.66ddxx	58.34ee	61.00xx	58.50ooxx	64.09	65.32gg	58.35axx*	67.50E	63.27	63.61GR	59.19Y	59.21a	58.86	63.00	63.39Kmmgg	65.00K	60.10D	65.75H	73.74
28ga.	"	71.25nxx	71.25	73.00K	72.67dd	67.84ee	71.25xx	68.00ooxx	72.34	73.57gg	67.85axx*	76.25E	73.27	69.61ffG	68.69Y	68.72	68.36	74.50pp	71.64ygg	77.25K	69.60D	.....	86.52

*‡ trucklots, delivered *† fob warehouse. ** ob city. *a delivered. *b ½" O.D. *c ⅝" O.D. *d per sf. *e 34" x 60" sheet. *f per 100 ft. *g 5 tons & up; cold roll, anneal & pickled 2B finish. *h incl. Federal tax. *i add 25¢ for pint of additive. *j 1100 & 3003 alloy, mill finish. *k bag of 3 cu ft. * treated with air entraining agent. *m 2-10M ft. *n tob mill fr equalized with nearest stocking competitor. *o 250 sacks or more. *p 100 sq ft. *r per lb. *s 30 lb bag. *t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh. *u 19.31 lb/sh. *v fob plant. *w 48 x 144" *x 0.11"th. *y 27 gauge. *aa 16M lb & up. *bb Per 50 lb bag. *dd add $1.00 cwt boxing. *ee 4 tons & up. *gg add $2/cwt boxing; $0.75/cwt on skids. *hh Theoretical wt for 48" x 96"; 60.4-lb per sh. *ii 300-bag lots *jj 100-lb bag. *mm Theoretical wt; 19.7-lb per sh. *nn 2% cash. *oo skid packed. *pp type 304. *qq Philadelphia and suburbs. *rr less 2% disc. 15 days. *ss less 2% disc. 10 days. *tt less 2% disc. 10th. *uu add 2% sales tax. *vv Type N. *xx less ½% disc. 10 days. *yy .021 ga. *zz .061" th. *A Per 100 lb. *C 15M lb. *D less ½% for cash. *E Quantity differential. *F less 5% disc. 10th. *G less ½% disc. 10th. *H Fed. tax exempt. *K less ½%, 10 days. *L 5% disc. 30 days. *M 3003: .452 for 1100. *N less 2%, 15th mo. *O less $2, cash & carry. *P less 2%, 15 days. *Q per ton. *R revised. *S add .10/bag under 200 bags. *T 5000# quantity on 4000# skids. *U 30 Msf quantity; $0.245 in 10 Msf quantity. *X per sq ft. *Y per sheet. *Z 6,000 lb or over. *AA 30,000 sf or over.



RB&W tells of new economies in structures bolted with A325 bolts

RB&W is presenting results of its cooperative shop bolting surveys to technical groups like the meeting of a major steel fabricators' association pictured above.

The surveys show that two A325 bolts, two nuts and two washers substituted for three regular high-strength bolts, three nuts and six washers in bearing-type connections give up to 40% savings in fastener costs alone. On top of this, they confirm the substantial increase in productivity through bolting.

But many engineers and architects lose the economic advantage of the new ASTM A325 bolts. Why? During the discussion period that followed the above talk, fabricators pointed out that structural designers are still using the old specifications instead of applying the latest Research Council specifications for joint design.

Many fabricators themselves don't fully realize the economy of A325 bolts in bearing-type connections allowing lower bids on structural jobs.

Since 1954, RB&W has pointed out technical-economic advantages of high-strength bolts over rivets. Now, large-head, short-thread A325 structural bolts make possible even greater economies. They mean savings in connecting and construction costs, more competitive steel structures, buildings that go up faster to produce income sooner, and industrial plants that better withstand vibration. It's up to you to put them to work.

Write for a copy of technical bulletin HHS-1. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

R B&W
117th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Sales office and warehouse at:** San Francisco, Calif. **Sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas. **Sales agents at:** Cleveland; Milwaukee; New Orleans; Denver; Fargo.

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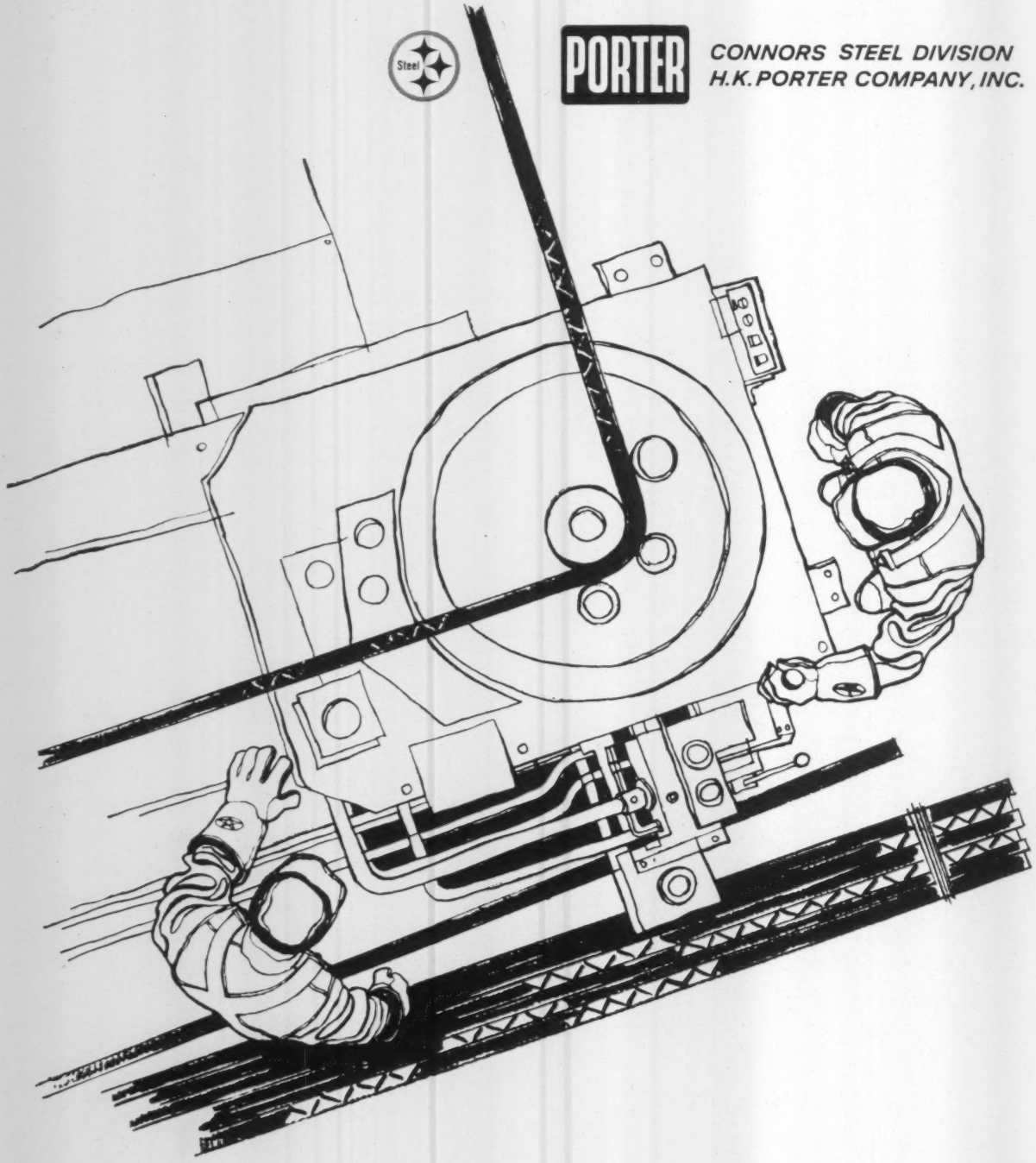
CONNORS STEEL DIVISION
H.K. PORTER COMPANY, INC.



Bid Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Medford**—BA 9/12—Tufts University, Harrison Ave., (selected list bidders) 5 story, 45x50x275 ft Men's DORMITORY. Approx. $1,000,000; 5 story 45x 50x167 ft Women's DORMITORY. Approx. $800,000. Perry, Shaw, Hephurn & Dean, 31 St. James Ave., Boston, Mass, archts. CD 12/22/59.

▲ **Mass., Peabody**—BA 9/27—Josiah B. Thomas Hospital, 17 King St., HOSPITAL ADDN., 17 King St. $1,000,000. Prout & Assoc., 17 Custom House St., Providence, R. I., archts. Fromme & Vosganian, 56 W. 45 St., New York, N. Y., struct. engrs. CD 5/3/61, under LB.

HEAVY CONSTRUCTION—LB & CA

▲† **Franchi Constr. Co., Inc.**, 425 Watertown St., Newton, Mass., LB **$1,551,425**, COMPOSITE MEDICAL FACILITY, Dow Air Force Base, ENG-19-016-62-4, BANGOR, ME. U. S. Eng., 424 Trapelo Rd., Waltham, Mass. BA 8/22. CD 8/15/61.

† **Miracle Constr. Co., Inc.**, 118 Beech St., Belmont, Mass., LB **$152,643**, Items 1, 2 & 3, FAMILY DWELLING, Cape Cod Light Station, Iv. 50-103-62, TRURO, MASS. First Coast Guard Sit., Supply Sect., 447 Commercial St., Boston, Mass. BA 8/10. CD 7/20/61.

BUILDINGS—LB & CA

▲ **Caron Constr. Co., Inc.**, 161 Baker St., Manchester, N. H., LB **$1,079,828**, JUNIOR HIGH SCHOOL, Fairground Area, NASHUA, N. H. City, 229 Main St., Nashua, N. H. BA 8/21. CD 8/4/61.

▲ **F. L. Collins & Sons, Inc.**, 408 Academy Bldg., Fall River, Mass., CA Approx. **$1,125,000**, (9 bidders), Bishop Casey Girls REGIONAL HIGH SCHOOL, TAUNTON, MASS. Diocese of Fall River, Chancery Office, 394 Highland Ave., Fall River, Mass. BA 8/17. CD 8/8/61.

▲ **Dimeo Constr. Co.**, 511 Westminster St., Providence, R. I., CA Est. **$1,700,000**, BIOLOGICAL RESEARCH BLDG., East Side Brown St., PROVIDENCE, R. I. Brown University, Dir. Constr. Planning, University Hall, Providence, R. I. BA 11/17/60. CD 10/25/60.

▲ **Cusano & Ocone, Inc.**, 20 Gorham Ave., Hamden, Conn. LB **$2,486,512**, (6 bidders), HIGH SCHOOL ADDN., HAMDEN, CONN. Town, School Bldg. Comn., Town Hall, Hamden, Conn. BA 8/22/61. CD 8/1/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **Md., Baltimore**—BA 9/13—City, Bureau Hys., 303 Municipal Bldg., Zone 2, INTERCHANGE, 7 BRIDGES, steel beam, complete grading, drainage and paving Jones Fall Expressway, Belvedere Ave. (Northern Blvd.) $5,000,000. Plans deposit $50. Geo. V. Waters, hy. engr. CD 4/27/59.

BUILDINGS—BA

▲ **N. Y., Rochester**—BA 9/12—Bd. Educ., 13 S. Fitzhugh St., 2 story SCHOOL, Otis St. $1,400,000. Carl C. Ade, 55 Canterbury St., Rochester, N. Y., archt. CD 1/22/59.

▲ **N. Y., Syracuse**—BA 9/12—Syracuse University, University Pl., men's DORMITORY and DINING HALL. $3,000,000. Plans deposit $50. King & King, 420 E. Genessee St., Syracuse, N. Y., archts. CD 8/4/61.

▲ **Md., Baltimore**—BA 9/14—Baltimore Housing Auth., 905 Equitable Bldg., Zone 2, Proj. MD-2-18, 758 units masonry, sixteen-2 story, four-3 story, four-14 story George B. Murphy HOMES. Over $8,000,000. Plans deposit $100. Meyer & Ayers, Federal Land Bank Bldg., 24 and St. Paul Sts., Baltimore 18, Md., archts. CD 5/21/48.

▲ **N. J., Livingston**—BA 9/19—St. Barnabas Medical Center, 685 High St., Newark, HOSPITAL, $5,000-000-$6,000,000. Ferrenz & Taylor, 1451 Broadway, New York City, N. Y., archts.

▲ **Pa., University Park**—BA 9/27—General State Auth., 18th & Herr Sts., Harrisburg, general construction, NUCLEAR STUDY and RESEARCH, hot cells, laboratories, for Pennsylvania State University Proj. 800-31.1. $1,175,000, Plans deposit $50; heating, ventilating and air conditioning facilities, Proj. 800-31.2, Plans deposit $50; plumbing construction, facilities, 800-31.3, Plans deposit $50; electrical construction, Proj. 800-31.4. Plans deposit $50. Lacy, Atherton and Davis, 1729 N. Front St., Harrisburg, Pa., archts.-engrs. CD 9/12/60.

HEAVY CONSTRUCTION—LB & CA

▲ **T & T Contg. Corp.**, 4814 Glenwood Rd., Brooklyn 3, N. Y., CA **$1,173,083**, Contr. 9, AUTOMATIC ELECTRIC PUMPING STATION within an Island of Safety, Seagirt Blvd. south side approx. at Beach 9 St., Fifth Ward, Queens Boro, NEW YORK. President Queens Boro, Rm. 228, Quenns Boro Hall, 120-55 Queens Blvd., Kew Gardens 24, N. Y. BA 6/30. CA 8/10. CD 7/10/61, under LB.

▲ **R. Zoppo Co., Inc.**, 842 Providence Hy., Norwood, Mass., CA **$1,515,328**, est. $1,500,000, West-side TRANSMISSION WATER MAIN, ROCHESTER, N. Y. Monroe County Water Auth., 339 East Ave., Rochester, N. Y. BA 7/6. CD 7/11/61, under LB.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 8/22, ROAD, **Case Constr. Co.**, Mount Airy, Md. and **T. Edgie Russell**, Frederick, Md., LB **$3,281,136**, (4 bidders), grade, drain, surf. Capitol Beltway from River Rd. to Seven Locks Rd. incl. relocation River Rd., reconstr. Burdett Rd., 15 span dual and 14 span single bridge, two single lane bridges and two culvts., M-512-53-55-56-57-58-320, Montgomery Co. CD 8/2/61.

▲ **James McHugh Constr. Co.**, 6449 South Park Ave., Chicago, Ill., CA **$4,096,520**, unit No. 1, Virginia Tunnel and Potomac Crossing of Potomac INTERCEPTOR SEWER, near Great Falls, Virginia, WASH., D. C. D. C. Govt. Dpt. Sanitary Engineering, 499 Pennsylvania Ave., NW, Wash., D. C. CD 7/14/60.

BUILDINGS—LB & CA

▲ **Abraham Sommer**, P.O. Box 188, Iselin, N. J., Owner Builds, est. cost **$14,000,000**, 23 story, 220 x 290 ft., 700,000 sq. ft., 135 W. 50 St. OFFICE, 134-146 W. 51 St., NEW YORK, N. Y. CD 5/9/61.

▲ **Beechcroft Towers**, c/o Jonathan Woodner Co., 575 Madison Ave., New York 22, N. Y., Owner Builds, **$8,000,000**, Beechcroft Towers, Section III, two 15 story RENTAL APARTMENTS, Kissena Blvd. between Franklin and Elder Aves., FLUSHING, N. Y. CD 11/10/60.

▲ **Benenson-Rose-Tisch**, 529 Fifth Ave., New York 17, N. Y., Owner Builds, **$3,285,000**, 13 story, 92 x 205 ft. OFFICE, 61-88 W. 46 St., 1180 6 Ave., NEW YORK, N. Y. CD 5/9/61.

▲ **Diesel Constr. Co.**, 642 Fifth Ave., New York 19, N. Y., CA Est. **$25,000,000**, 30 story HOTEL, Park Ave. and 61 St. northwest corner, NEW YORK, N. Y. Loew's Inc., 1540 Broadway, New York 36, N. Y. CA early Aug. CD 7/31/61.

▲ **H R H Constr. Corp.**, 579 Fifth Ave., New York 17, N. Y., CA Est. **$19,620,000**, Washbridge Houses, four 32 story APARTMENTS over approaches to George Washington Bridge, NEW YORK, N. Y. Washbridge Housing Corp., subsidiary Kratter Corp., 521 Fifth Ave., New York 17, N. Y. CD 1/27/61. CA under Bridge Site Bldg. Corp.

▲ **HRH Constr. Corp.**, 579 5 Ave., New York 17, N. Y., CA Est. **$5,000,000**, 5 story HEADQUARTERS BLDG., West 66 St. and Amsterdam Ave., NEW YORK, N. Y. American Red Cross, New York Chapter, 315 Lexington Ave., New York, N. Y. BA 7/25. CD 7/24/61.

▲ **200 Central Park South, Inc.**, 551 Fifth Ave., New York 17, N. Y., Owner Builds, **$4,000,000**, APARTMENT, 200-204 Central Park S., NEW YORK, N. Y. Wechsler & Schimenti, 118 E. 25 St., New York 10, N. Y., archts. Irving Kleiman, 30 Broadway, Massapequa, N. Y., mech. engr. Greenhut & Taffel, 114 E. 32 St., New York 16, N. Y., struct engrs. CD 11/16/60.

▲ **K-Way Constructors, Inc.**, 32-15 Lawrence St., Flushing, N. Y., CA Est. **$10,000,000**, 1 story, 900,000 sq. ft. PLANT, Rte. 34 and New York and Long Branch R. R., HOLMDEL, N. J. Lily Tulip Paper Co., 122 E. 42 St., New York, N. Y. CA 8/15. CD 8/1/61.

▲ **Even Ray Corp.**, 911 North Main St., Toms River, N. J., Owner Builds, **$3,500,000**, Garden APARTMENTS Cedar Glen Co., Rd. 571, Manchester Tpk., LAKEHURST, N. J. Paul B. West, 811 North Main St., Toms River, N. J., archt.

▲† **Blake Constr. Co., Inc.**, 1120 Connecticut Ave., NW, Wash., D. C., LB **$3,738,000**, (14 bidders), EMPLOYMENT SECURITY BLDG., Dpt. Labor, 6th St. between Pennsylvania Ave., and C Sts., NW, WASH., D. C. General Services Admin., 19th and C Sts., NW, Wash., D. C. BA 8/22/61. CD 8/15/61.

SOUTH

BUILDINGS—BA

▲ **Ga., Atlanta**—BA 9/14—City Bd. Educ., City Hall 150,000 sq. ft. Harper HIGH SCHOOL, $1,500,000. Plan deposit $100. Howard, Nielsen & Lyne, 318 Fairlie St., N.W., Atlanta, Ga., archts. CD 6/16/61.

BUILDINGS—LB & CA

▲ **W. A. Sherman**, McLean, Va., LB **$2,510,000**, (5 bidders), Thomas A. Edison HIGH SCHOOL, FAIRFAX, VA. Fairfax County Bd. Educ., Fairfax, Va. BA 8/22/61. CD 8/22/61.

▲ **Beers Constr. Co.**, 70 Ellis St., NE, Atlanta, Ga. LB **$2,228,380**, 100,000 sq. ft., 150 bed, HOSPITAL, EAST POINT, GA. South Fulton Hospital Auth., 114 East Point St., East Point, Ga. BA 8/16/61. CD 7/18/61.

▲ **Robert L. Turchin, Inc.**, 1835 Purdy Ave., Miami Beach, Fla., CA Approx. **$1,750,000**, SHOPPING CENTER, Golden Glades Dr. and NE 8th Ave., MIAMI, FLA. Jefferson Stores, Inc., 2140 NW 23rd St., Miami, Fla. BA 7/12/61. CA 8/17/61. CD 8/2/61. under LB.

▲ **Winchester Constr. Co.**, 1537 Spruce Ave., Tallahassee, Fla., LB **$1,410,000**, 169 units MARRIED STUDENTS HOUSING Florida State University, Proj. FLA. 8-CH-29(D) TALLAHASSEE, FLA. Florida State Bd. Control, School Business, State University, Tallahassee, Fla. BA 8/16/61. CD 8/2/61.

▲ **Jesse F. Heard & Sons, Inc.**, Box 336, West Monroe, La., LB **$1,325,000** (3 bidders), Combined Bid, Unit A, women's RESIDENCE HALL; Unit B, men's RESIDENCE HALL: Unit C, COLLEGE UNION BLDG., Northeast Louisiana State College; LB **$490,861** est. $750,000 (3 bidders), COLLEGE UNION BLDG.; LB **$411,305** est. $450,000 (3 bidders), men's RESIDENCE HALL, MONROE, LA. State Bd. Educ., Stubb's Hall, Monroe, La. BA 8/18. CD 8/7/61; **W. C. Salley**, Box 24, Monroe, La., LB **$416,000** est. $450,000 (3 bidders), Unit A, women's RESIDENCE HALL, Northeast Louisiana State College (Monroe, La.).

▲ **Foster & Creighton Co.**, American National Bank Bldg., Nashville, Tenn., CA **$2,926,000**, 240 unit APARTMENTS, NASHVILLE, TENN. Vanderbilt University, 21st Ave. S., Nashville, Tenn. BA 6/20/61. CD 6/27/61 under LB.

▲ **Southern Builders, Inc.**, 3355 Poplar St., Memphis, Tenn., CA Est. **$2,500,000**, 15 story, 2 story PENTHOUSE OFFICE, 2121 8th Ave., BIRMINGHAM, ALA. Bloomfield-Sender Enterprises, 1717 West End Ave., Nashville, Tenn. CD 6/22/61, under CA.

MIDDLE WEST

▲ **O., Cincinnati**—BA 9/12—City, City Hall and Bd. Comrs. Hamilton Co., Courthouse, Ross Run SEWER, $2,000,000. Plans deposit $5.73. CD 4/13/60 and 11/9/56.

▲ **Ill., Chicago**—BA 9/20—City, City Hall, PUMP CHEMICAL and ADMINISTRATION BLDG. Central District Filtration Plant. $7,000,000. CD 12/16/60.

BUILDINGS—BA

▲ **O., Akron**—BA 9/13—Bd. Educ., 70 N. Broadway, HIGH SCHOOL, Bond and Rampart Aves. Plans deposit $200. Tuchman & Canute, 777 W. Market St., Zone 3, archts. CD 2/9/61.

▲ **Mich., Bloomfield Hills**—BA 9/25—Bloomfield Hills Bd. Educ. Dist. 2, 4200 Andover Rd., JUNIOR HIGH SCHOOL, Opdyke and Kensington Rds. $1,600,000. Plans deposit $25. Extended date. Tarapata, MacMahon Assocs., 1591 Woodward Ave., Bloomfield Hills, Mich., archts. CD 7/13/61.

▲ **O., Kent**—BA 9/27—Dpt. P. Wks., State Depts. Bldg., Columbus, Zone 15, DORMITORIES E, F, G, and H, DINING FACILITIES, MARRIED STUDENTS HOUSING, Kent State University, $7,000,000. Plans deposit $100. Fulton, DelaMotte, Larson & Nassau, 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 8/15/60.

HEAVY CONSTRUCTION—LB & CA

▲ **Thompson Constr. Co., Inc.**, 3840 Prospect St., Indianapolis, Ind., CA **$1,124,166**, Section A, east Marion County INTERCEPTOR SEWER, INDIANAPOLIS, IND. Bd. Sanitary Comrs., 421 N. Pennsylvania St., Indianapolis, Ind. CD 7/19/61.
Tousley Constr. Co., Inc., 925 E. St. Clair St., Indianapolis, Ind., CA **$1,150,000**, Section B, East Marion County Interceptor Sewer (Indianapolis, Ind.).
Paul H. Fox, New Palestine, Ind., CA **$97,308**, Section C, East Marion County INTERCEPTOR SEWER (Indianapolis, Ind.). Grand total $2,371,474. BA 7/19/61. CA 8/15/61. CD 7/19/61.

▲ **Tousley Constr. Co.**, 925 E. St. Clair St., Indianapolis, Ind., LB **$1,016,500**, extending north branch BELMONT INTERCEPTOR SEWER from 42nd and Crooked Creek north to 79th and Ditch Rd., INDIANAPOLIS, IND. Bd. Sanitary Comrs., 421 N. Pennsylvania St., Indianapolis, Ind. CD 4/10/61.

BUILDINGS—LB & CA

▲ **Madison Parkway Estates, Inc.**, Parkway Blvd., Madison, O. Owner builds **$4,125,000**, 250 NATIONAL HOMES, MADISON, O.

▲ **M. A. Lombard & Sons Co.**, 1215 W. 103rd St., Chicago, Ill., LB **$2,974,974**, 150 bed HOSPITAL ADDN., HINSDALE, ILL. Hinsdale Sanitarium & Hospital, 120 N. Oak St., Hinsdale, Ill. Fugard, Burt, Wilkinson & Orth, 520 N. Michigan Ave., Chicago 11, Ill., archts.

▲ **O. Frank Heinz**, 2510 S.W. Adams St., Peoria, Ill., LB **$2,163,800** (4 bidders), MANUAL HIGH SCHOOL, PEORIA, ILL. Peoria Public High Schools, 3202 Wisconsin Ave., Peoria, Ill. BA 8/1/61. CD 5/25/61.
Comfort Control Corp., 2309 S.W. Adams St., Peoria, Ill., LB **$481,925** (4 bidders), heating and ventilating contract for Manual HIGH SCHOOL (Peoria, Ill.).

▲ **Sullivan-Smith Realty Co.**, 22963 W. Outer Dr., Dearborn, Mich., Owner Builds, **$2,000,000**, two 20-story APARTMENTS, swimming pool, community bldg., Vernier and Beaconfield Aves., DETROIT, MICH. Levine-Alpern Assocs., 18131 Jas. Couzens, Detroit, Mich., archts.

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HEAVY CONSTRUCTION—BA

▲† **Oklahoma**—BA 9/19—U. S. Eng., Box 61, Tulsa, Zone 2, RELOCATING 4½ mi. US Hy. 69, concrete paving Section 1, Eufaula Reservoir, CIVENG-34-066-62-11. $1,000,000. Plans deposit $10. CD 8/8/61.

▲† **Texas**—BA About 9/19—U. S. Eng., P.O. Box 1600, Fort Worth, DREDGING approx. 5,000,000 cu. yd. of new and shoal material from total channel length of 11,800 lin. ft., Houston Ship Channel, Carpenters Bayou to 0.5 mi. above Patrick Bayou, Harris Co., ENG-41-243-62-5. $2,000,000. CD 9/22/60.

▲† **New Mexico**—BA About 9/19—U. S. Eng., P.O. Box 1538, Albuquerque, LEVEE and CHANNEL IMPRVTS., Rio Grande Floodway, Bosque Bridge to Rio Puerco, Socorro Co., CIVENG-29-066-62-1. $1,000,000. CD 8/4/61.

▲† **Oklahoma**—BA 9/20—U. S. Eng., Box 61, Tulsa, Zone 2, RELOCATING 2.6 mi. US Hy. 69, M.K.T. RAILROAD SUBGRAD, Section III, CIVENG-34-066-62-14, $1,500,000. Plans deposit $10. CD 8/15/61.

▲† **Texas**—BA About 9/27—U. S. Eng., P.O. Box 1600, Fort Worth, DREDGING 41,489.9 lin. ft. channel at 38 ft. depth below M.L.T. to remove approx. 6,634,000 cu. yd. of virgin and shoal material, Neches River Channel Realignment and Curve Easing, Jefferson and Orange Counties, ENG-41-243-62-8, $1,500,000.

▲† **North Dakota**—BA 10/10—U. S. Eng., Ballistic Missile Constr. Office, 5651 W. 96th St., Los Angeles, Calif., MINUTEMAN MISSILE COMPLEX FACILITIES, near Minot Air Force Base, ENG-04-548-62-6, over $10,000,000. Ralph M. Parson Co., 617 W. 7th St., Los Angeles 17, Calif., engr. CD 8/17/61.

BUILDINGS—BA

▲ **Ark., Truman**—BA 9/13—City Housing Auth., City Hall, 200 brick, veneer, wood DWELLING units, $2,000,000. Stanley Brown, 4012 Cedar Springs Road, Dallas, Tex., archt. CD 7/19/61.

▲ **Mo., Columbia**—BA 9/14—Curators University of Missouri, 116 Jesse Hall, (A) 2 story 57,300 sq. ft. STUDENT UNION ANNEX, Rollins St.; (B) 3 story 33,000 sq. ft. STUDENT UNION ADDN., Hitt St. $2,605,000. Plans deposit $50. Jamieson, Spearl, Hammond & Grolock, 1875 Arcade Bldg., St. Louis 1, Mo., archts. CD 11/21/60.

▲ **Tex., Victoria**—BA 9/16—Congregation of the Sisters of the Incarnate Word & Blessed Sacrament, 105 W. Church St., MOTHER HOUSE and novitiate, $1,500,000. Plans deposit $50. DiStefano & Cerna, 6936 San Pedro Ave., San Antonio, Tex., archts. Oscar W. Schuchart, 3360 Fredericksburg Rd., and DeStefano & Cerna, 6936 San Pedro Ave., San Antonio, Tex., engrs. Extended date. CD 8/15/61.

▲ **Tex., San Antonio**—BA 9/18—City Public Service Bd., Navarro and Villita Streets, Selected List of Bidders, W. B. Tuttle TURBO GENERATOR ELECTRIC POWER PLANT, Unit No. 4. $5,000,000. Plans deposit $100. Gibbs & Hill, Pennsylvania Station Bldg., New York, N. Y., engr. CD 2/21/61.

▲ **Minn., Maplewood**—BA 9/19—Bd. Educ. Independent School Dist. No. 622, 1 and 2 story JUNIOR HIGH SCHOOL, Hazlewood and County Rd. B. $1,000,000. Corwin, Seppanen & Assoc., Inc., E. 818 1st National Bank Bldg., St. Paul, Min., archt.

† **Tex., El Paso—BA** 9/21—U. S. Eng., Box 1538, Albuquerque, N. M., REGIMENTAL GYMNASIUM, Fort Bliss, ENG-29-005-62-14. $500,000. CD 6/20/61, under LB.

▲ **Minn., Minneapolis**—BA 9/26—Tyrone Guthrie Theatre Foundation, 725 Vineland Pl., 142x142 THEATRE. Extended date. $1,700,000. Plans deposit $50. R. Rapson, 720 Washington Ave. S.E., Minneapolis, Minn., archt. Oftedal, Locke, Broadston & Assocs., Inc., 623 Sexton Bldg., Minneapolis, Minn., engrs. CD 8/10/61.

HEAVY CONSTRUCTION—LB & CA

▲ **English Electric Co., Ltd.**, 14 Strachan St., Toronto, Ont., Canada, LB $2,507,000, est. $3,700,000, (5 bidders), TURBINES for Marham Ferry Dam Power Plant, Vinita, OKLAHOMA, Grand River Dam Auth., Vinita, Okla. BA 8/15/61. CD 7/12/61.

▲† **Massman Constr. Co.**, 3917 Broadway, Kansas City, 11, Mo., LB $5,159,405, Schedule 1, T & NO RAILROAD RELOCATION, Amistad Dam, Rio Grande International Dams, Val Verde Co. UDA 6457, TEXAS. International Boundary & Water Comn., Mart Bldg., 206 San Francisco St., El Paso, Tex. BA 8/18/61. CD 7/11/61.
Collins Constr. Co., 2821 E. 19th St., Austin, Tex., LB $2,581,981, Schedule 2, for Amistad Dam, (Texas.)
W. A. Smith Constr. Co., 1401 Fairfax Trafficway, Kansas City 15, Mo., LB $1,364,975, Schedule 3, for Amistad Dam, (Texas).
San Ore Constr. Co. and **Elmer C. Gardner, Inc.**, P.O. Box 9071, Houston, Tex., LB $202,000, Schedule 4, for Amistad Dam, (Texas).
H. B. Zachry Properties, Inc., 310 S. St., Marys St., San Antonio, Tex., and **Brown & Root, Inc.**, 4100 Clinton Drive, Houston, Tex., LB $11,953,000, est. $10,458,094, (12 bidders), Schedule 5 (entire project) for Amistad Dam, (Texas.)

▲ **Houston Contg. Co.**, 2807 Buffalo Speedway, Houston, Tex., CA Est. $3,925,000, 65 mi. 30 to 36 in. GAS LINE LOOPS, vicinity Fulshear, Texas to vicinity New Roads, La., TEXAS and LOUISIANA. Transcontinental Gas Pipeline Corp., 3100 Travis St., Houston, Tex. CD 1/12/50.

BUILDINGS—LB & CA

▲ **Pickens-Bond Constr. Co.**, Box 1807, Muskogee, Okla., LB **$2,760,083**, est. $3,000,000, (6 bidders), two DORMITORIES, six APARTMENTS, one CAFETERIA, Oklahoma State University, STILLWATER, OKLA. Bd Regents, A. & M. Colleges, Stillwater, Okla. BA 8/15/61. CD 8/2/61.

▲ **James E. Simon Co. Inc.**, 819 E. Seventh St., and P.O. Box 752, North Platte, Neb., CA **$1,183,630**, brick, concrete, steel, etc. JUNIOR HIGH SCHOOL, two elementary schools and Senior high school addn., NORTH PLATTE, NEB. Bd Educ., North Platte, Neb. BA 8/10/61. CD 8/15/61, under LB.

▲ **J. E. Dunn Constr. Co.**, 929 Holmes, Kansas City, Mo., CA **$1,450,000**, 3 story 272,150 sq. ft. HS-CLASSROOM, 2 story, 110x193 ft. GYMNASIUM and CAFETERIA, FACULTY RESIDENCE, KANSAS CITY, MO. Rockhurst Rd. Regents, Rockhurst College, 53 and Troost, Kansas City, Mo. BA 8/8. CD 8/8/61.

▲ **R. K. & A. Jones, Inc.**, P.O. Box 297, Florissant, Mo., CA Est. **$2,000,000**, 180-unit HOLIDAY INN MOTEL, incl. three bldgs. 60 unit each and commercial bldg., restaurant, etc. swimming pool, 350-car parking opposite Kansas City Municipal Airport, KANSAS CITY, MO. K. C. Airtel Corp., c/o Phil Davis, Holiday Inn Motel, Hy. 40, Independence, Mo. CA 8/16. CD 10/13/60.

▲ **R. K. & A. Jones, Inc.**, P.O. Box 297, Florissant, Mo., Est. **$1,000,000**, 100-unit HOLIDAY INN MOTEL, incl. two bldgs. 50-unit each, restaurant, meeting hall, admin. bldg., group around swimming pool, 200-car parking Interstate 29 and Hy. 36, ST. JOSEPH, MO. St. Joseph Inn, Inc., P.O. Box 297, Florissant, Mo. CA 8/10.

▲ **Newton Constr. Co., Inc.**, 2305 Industrial Blvd. and P.O. Box 4108, Odessa, Tex., CA Est. **$1,250,000**, 2 story, 150-room Ramada INN, Incl. swimming pool, playgrounds, parking areas, etc., adjacent to Interstate No. 44 and N. Glenstone, SPRINGFIELD, MO. Glenstone Cloverleaf Corp., c/o E. H. Gubser, pres., Springfield, Mo., operators, and Ramada Franchise Div., 3825 E. Van Buren St., Phoenix, Ariz. Vaughan-Kenyon & Assocs., Estate Life Ins. Bldg., Amarillo, Tex., archts. CD 10/17/60.

▲ **Allis-Chalmers Corp.**, 1126 S. 70 St., Milwaukee, Wis., CA **$2,200,000**, est. $2,814,000, Contr. 61, (A) 4th Unit Turbine GENERATOR ADDN., 60,000 capacity James River Power Plant, SPRINGFIELD, MO. City, Purchasing Agent, 301 E. Central St., Springfield, Mo. Burns & McDonnell Eng. Co., 4600 E. 63 Trafficway and P.O. Box 173, Kansas City 41, Mo., engr. Grand total $4,529,687. BA 7/25. CD 7/12/61.

▲ **Ten-Eyck-Shaw, Inc.**, 2327 Langford St., Dallas, Tex., CA Est. **$4,700,000**, Stemmons Towers, East, three 12 story OFFICE BLDGS., 2700 Blk. Stemmons Freeway, DALLAS, TEX. Trammel Crow & Industrial Properties, 2100 Stemmons Freeway, Dallas, Tex. Harold A. Berry, 423 S. Field St., and Harwell Hamilton Harris, Republic National Bank Bldg., Dallas, Tex., archts. CD 3/29/60.

▲ **Baxter Constr. Co.**, Box 7744, Houston, Tex., CA **$1,783,000**, PARKING GARAGE HOUSTON, TEX. Texas Medical Center (St. Luke's Methodist and Texas Children's Hospitals) 1133 M. D. Anderson Blvd. Houston, Tex. BA 6/20/61. CD 7/12/61, under LB.

▲ **Martin K. Eby**, 3535 S. Huron, Englewood, Colo., CA **$3,451,183**, BANK ADDN. Lincoln St. DENVER, COLO. Denver United States National Bank, Mile High Center, Bldg., Denver, Colo. BA 7/25/61. CA 8/16/61. CD 7/31/61, under LB.
Midwest Plumbing & Heating Inc., 2450 Blake St., Denver, Colo., CA **$737,740**, MECHANICAL for Lincoln Street Addn. (Denver, Colo.)

▲† **Robert E. McKee, Inc.**, P.O. Box 1706 Santa Fe, N. M., CA **$1,450,100**, CONTAMINATED WASTE PLANT, for Los Alamos Scientific Laboratory, ENG-291-61-5, LOS ALAMOS, N. M. Atomic Energy Comn., Los Alamos Area Office, Los Alamos, N. M. BA 7/20/61. CD 8/8/61, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **CALIFORNIA**—BA 9/27—State Div. Hys., 1120 N St., Sacramento, ROAD,
Santa Barbara Co.—2.1 mi. four lane freeway. **$4,690,000.** CD 12/5/60.

BUILDINGS—BA

▲ **Hawaii, Honolulu**—BA 9/14—University of Hawaii, University Ave., 10 story International Gateway House STUDENT DORMITORY, Proj. HHFA-CH-6(D), G-5549 and G-5550. $1,300,000. Plans deposit $50. Merrill, Onodera, Roehrig & Kinder, 1145 Bishop St., Rm. 504, Damon Bldg., Honolulu, Hawaii, archts. CD 11/22/60.

HEAVY CONSTRUCTION—LB & CA

▲ **IDAHO**—Dpt. Hys., 3211 State St., Boise, Bids opened 8/15, ROAD,
Jack B. Parsons Constr. Co., 250 N. 3rd St. E., Smithfield, Utah, LB **$1,370,625**, 4-lane divided roadway, drainage structures, plantmix bit. surf. four concrete overpasses, two concrete underpasses, 2.345 mi. Interstate 15 and .409 mi. Pocatello Creek Connection, Bannock Co. CD 8/2/61.

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▲ **Frazier-Davis Constr. Co.,** 1319 Mackland Ave., St. Louis, Mo., CA **$6,193,685,** 4,333 ft. long, 35 ft. diam. DIVERSION TUNNEL, Oroville Dam, Feather River Proj. Butte Co., CALIFORNIA. State Dpt. Water Resources, 1120 N St., Sacramento, Calif. BA 8/9. CA 8/16. CD 8/11/61, under LB.

▲ **M. H. Golden Constr. Co.,** 3485 Noell St., San Diego 1, Calif. LB **$1,608,000,** est. $1,528,000, (7 bidders), Calif. BA 8/17. CD 7/11/61.
NUCLEAR SUBMARINE PIER, Naval Station, Spec. 30346, SAN DIEGO, CALIF. Southwest Div. Bureau Yards & Docks, 1220 Pacific Hy., San Diego 32, Calif. BA 8/22; CD 8/15/61.

▲ **Fisher Contr. Co.,** P.O. Box 6306, Phoenix, Ariz., LB **$1,046,810,** est. $800,000, (9 bidders), Sanitago AQUEDUCT, Unit 2, SANTA ANA, CALIF. El Toro Water Dist. and Los Alisos Water Dist., 410 W. 8 St., Santa Ana, Calif. Boyle Engineering, Spurgeon Bldg., Santa Ana, Calif., engr. BA 8/15.

BUILDINGS—LB & CA

▲ **Metropolitan Development Co.,** Box 609, Canoga Park, Calif., Owner Builds, **$2,069,300,** 113 stucco-wood frame DWELLINGS on six streets, Tract 25870, CANOGA PARK, CALIF. Duncan & Conroy, 13605 Ventura Blvd., Sherman Oaks, Calif., archts.

▲ **Ernest W. Hahn,** 219 S. Hawthorne Blvd., Hawthorne, Calif., CA **$3,000,000,** 100,000 sq. ft. SHOPPING CENTER, Hy. 9 and Stevens Creek Blvd., CUPERTINO, CALIF. Herbert Ketell Inc., 727 Industrial Rd., San Carlos, Calif.

▲ **Philip Rafalow Inc.,** 512 S. San Vicente, Los Angeles, Calif., CA **$2,000,000** APARTMENT DEVELOPMENT, swimming pools, recreation areas and garages, Stevens Creek Shopping Center, CUPERTINO, CALIF. Herbert Ketell, Inc., 727 Industrial Rd., San Carlos, Calif. Robert D. Wilson, 695 Edna Way, San Mateo, Calif., archt. Pacific Engineers, 514 Bryant St., Palo Alto, Calif., engrs.

▲ **James E. Roberts Co.,** 980 41 St., Oakland, Calif., LB **$1,086,700** (2 bidders) RESIDENCE HALL No. 5, Davis Campus of University of California, DAVIS, CALIF. Office of Architects and Engineers, University of California, Davis, Calif. BA 8/15.

Escondido Union School Dist., 5 and Maple Sts., Escondido, Calif., rejected bids July 10, Del Dios HIGH SCHOOL, ESCONDIDO, CALIF. (Correction—status). CA **$939,393.** CD 8/11, under CA.

▲ **Paul Hardeman, Inc.,** 10579 Dale Ave., Stanton, Calif., LB **$1,216,000** (8 bidders) combined mechanical work 6 story 310,000 sq. ft. SCIENCE and CLASSROOM BLDG., Orange County State College, W. O. 4414GC-20, FULLERTON, CALIF. State Div. Architecture, 107 South Broadway, Los Angeles, Calif. BA 8/16. CD 7/10/61;
Sherwin Electric Service, 3229 Casitas Ave., Los Angeles, Calif., LB **$893,450** (8 bidders) electrical work, Science and Classroom Bldg., Orange County State College, W. O. 4414GC-20, (Fullerton, Calif.).

▲ **Diverco Constructors,** 10238 Lakewood Blvd., Downey, Calif., CA est. **$3,500,000,** 14 story HOTEL, parking deck, Kings Road and Sunset Blvd., HOLLYWOOD, CALIF. Sennes-Pick, c/o Martin Stern, Jr., archt., 8325 Wilshire Blvd., Beverly Hills, Calif. BA 8/3. CD 7/25/61.

▲ **William J. Moran Co.,** 1011 S. Fremont St., Alhambra, Calif., CA est. **$4,000,000,** 2 story 144,000 sq. ft. DEPARTMENT STORE, 1,000-car parking, POMONA, CALIF. Buffums Department Store, Pine and Broadway, Long Beach, Calif. Welton Becket & Assoc., 10,000 Santa Monica Blvd., Los Angeles, Calif., archts. CD 2/15/61.

▲ **Williams & Burrows Inc.,** 500 Harbor Blvd., Belmont, Calif., LB **$2,133,713** (6 bidders) steel frame and conc. aggreg. conc. roof on steel deck COUNTY OFFICE incl. 4 story tower behind Hall of Justice, REDWOOD CITY, CALIF. San Mateo Co., County Courthouse, Redwood City, Calif. BA 8/15. CD 7/21/61.

▲ **Pacific Maritime Assn., International Longshoreman's & Warehousemen's Union Pension Fund,** c/o Richard Ernst, atty., 16 California St., San Francisco, Calif., rejected bids July 20, 297 wood frame, stucco ext. COOPERATIVE APARTMENTS, Western Addn., SAN FRANCISCO, CALIF. **$4,500,000.** CD 7/7/61.

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CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **Tallman Constr. Co., Ltd.,** 600 Planet Rd., Winnipeg, Man., CA **$2,908,034,** STRENGTHENING and EXTENDING RUNWAYS, connecting taxiway to threshold runway, Winnipeg International Airport, WINNIPEG, MAN. Dpt. Transport, Hunter Bldg., Ottawa, Ont. BA 7/11/61. CD 7/18/61, under LB.

▲ **Hydro-Electric Power Comn. of Ontario,** 620 University Ave., Toronto, Ont., Owner Builds, **$7,000,000,** INTERNATIONAL CONTROL DAM EXTENSION, incl. five 100 ft. wide sluices and gates, two guide walls, Upper Niagara River, Niagara Falls, ONTARIO. CD 8/22/61.

▲ **Foundation Co. of Canada Ltd.,** 123 Eglinton Ave. E., Toronto, Ont., LB **$2,643,284,** steel, aluminum, glass, air-conditioned ADMINISTRATION BLDG., Toronto International Airport, Malton, TORONTO, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. BA 8/17/61. CD 7/24/61.

▲ **Foundation Co. of Canada Ltd.,** 123 Eglinton Ave. E., Toronto, Ont., LB **$1,105,929,** HARBOR REPAIRS, SHIP CHANNEL EXTENSION, Toronto Harbor, TORONTO, ONT. Dpt. P. Wks., Sir Charles Tupper Bldg., Ottawa, Ont. BA 8/16/61. CD 7/27/61.

BUILDINGS—LB & CA

▲ **A. V. Carlson Ltd.,** 10550 109th St., Edmonton, Alta., CA Est. **$1,500,000,** 13 story APARTMENT, Grandin Towers, 110th St., EDMONTON, ALTA. Chartered Invesements Ltd., 10166 100th St., Edmonton, Alta. J. A. MacDonald, 833 Tegler Bldg., Edmonton, Alta., archt. Read, Jones, Christoffersen, 11536 Jasper St., Edmonton, Alta., engr.

▲ **Koppers of Canada, Ltd.,** 272 Palesford Rd., Toronto 18, Ont., CA, 2-strand continuous BILLET CASTING MACHINE to produce 75,000 tons per year, EDMONTON, ALTA., Premier Steel Mills Ltd., 507 Pace d'Armes, Montreal, Que. CD 3/18/58.

▲ **Dell Constr. Co., Ltd.,** 2461 Bloor St. W., Toronto, Ont., LB **$1,104,271,** federal-provincial ROW HOUSING UNITS, Westwood Park, HALIFAX, N. S. Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S. BA 8/15/61. CD 7/31/61.

▲ **Don Valley Constr. Co.,** c/o Universal Plumbing Co., Ltd., 90 Brimley Rd., Scarborough, Ont., Owner Builds, **$1,000,000,** 12 story, L-shaped, 176 ft. front APARTMENT, Richard St. N., LONDON, ONT.

▲ **Canadian Bechtel Ltd.,** 25 King St. W., Toronto, Ont., CA Total Est. **$3,000,000,** crude oil DISTILLATION PLANT ADDN., SARNIA, ONT. Imperial Oil Ltd., 445 Christian St. S., Sarnia, Ont.

▲ **Thomas Fuller Constr. Co., Ltd.,** 199 Richmond Rd., Ottawa, Ont., CA **$1,738,488,** 4 story COMPUTOR CENTRE for Income Tax Dpt. Tunney's Pasture, OTTAWA, ONT. Dpt. P. Wks., Sir Charles Tupper Bldg., Ottawa, Ont. BA 8/9/61. CD 8/15/61, under LB.

▲ **E. G. Cape & Co., Ltd.,** 4898 Western Ave., Montreal, Que., LB **$21,695,000,** (This bid is contingent on city changing some of its standard regulations governing contracts) est. $24,400,000 (4 bidders), CITY HALL, TORONTO, ONT. Bd. Control, City, City Hall, Toronto, Ont. BA 8/16/61. CD 6/21/61;

▲ **E. G. M. Cape & Co., (1956) Ltd.,** 4898 Western Ave., Montreal, Que., CA structural steel PULP MILL ADDN., CHANDLER, QUE. Gaspesia Sulphite Co., Ltd., 10 Rue des Capucins, Quebec City, Que. Total Est. $4,000,000. BA 7/31/61. CD 7/25/61.

▲ **Foundation Co. of Canada Ltd.,** 1900 Sherbrooke St. W., Montreal, Que., CA Est. **$1,000,000,** RESIDENCE No. 3, McGill Campus, MONTREAL, QUE. Bd. Governors, McGill University, McGill St., Montreal, Que. Durnford, Dolton, Chadwick & Ellwood, 4101 St. Catherine St. W., Montreal, Que., archts.

▲ **Adelard Jacques Ltee,** 526 Galt St. W., Sherbrooke, Que., CA Est. **$1,600,000,** (5 bidders), STUDENTS RESIDENCE, LIBRARY, St. Catherine Rd., SHERBROOKE, QUE. Universite de Sherbrooke, 195 Marquette St., Sherbrooke, Que. BA 8/16/61. CD 8/8/61.

PROPOSED PROJECTS

WATER SUPPLY

Ariz., Phoenix—City, City Hall, 10 m.g. WATER RESERVOIR on Shaw Butte and 20 m.g. RESERVOIR at Squaw Peak Water Treatment Plant, Proj. No. W-6112(BI), $1,017,500, John E. Stephens & Assocs., 3033 N. Central Ave., consult. engrs.; WATER LINES for fire protection and integration in area from 2nd Drive, 23rd Ave., Missouri Ave. and Shangri-La, Proj. No. W-61102(BI), $273,000, Engineering Corp. of America, 310 E. Thomas Rd., consult. engrs. CD 6/1/61.

SEWERS, WASTE DISPOSAL

▲ **Conn., Wallingford**—Town, Town Hall, SEWER LATERALS, Ridgeland, Colonial Manor and Parkview, $1,000,000, CD 9/9/60; SEWER LATERALS, Green Manor, $500,000. Bowe, Albertson & Assocs., 75 West St., New York, N. Y., consult. engrs.

Ill., St. Charles—City, City Hall, SEWAGE TREATMENT FACILITIES, $750,000.

▲ **Ore., Lake Oswego**—City, City Hall, voted bonds INTERCEPTOR and SECONDARY TREATMENT PLANT, SEWAGE FACILITIES, $1,250,000. BA winter 1961.

BRIDGES

▲ **O., Columbus**—City Service Director, City Hall, Zone 15, GRADE CROSSING ELIMINATION, Morse Rd. and New York Central and Pennsylvania R.R. tracks, incl. 2,000 ft. street extension and imprvs., Linking Morse Rd. with Interstate Rte. 71 by ramps, $1,000,000, Barrett Associated Engineers Ltd., 1500 W. 1st Ave., consult. engrs.; GRADE CROSSING ELIMINATION E. North Broadway and New York Central and Pennsylvania R.R. tracks, incl. 4,500 ft. street extension and imprv., connecting to ramps of Interstate Rte. 71, $1,000,000, Rackoff Assocs., 867 S. James Rd., consult. engrs. Robert E. Werner, city engr. CD 11/15/60.

STREETS AND ROADS

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, ROAD,

Baltimore, Harford and Cecil Counties—Northeastern Expressway Toll Rd., dual hy. from Delaware line to Delaware Memorial Bridge to parallel present Pulaski Hy., Baltimore to Delaware Line. $90,000,000. Bids Sept. 5 for first section in Baltimore.

† **O., Cincinnati**—City, City Hall, $7,000,000, bond election Nov. 7, STREET IMPRVS. Arthur Bird, c/o owners, engr. CD 4/19/49.

▲ **O., Columbus**—City Service Director, City Hall, Zone 15, and Franklin Co. Engineer, 970 Dublin Rd., EXTENDING 17th AVE. from North Freeway to Port Columbus, 4-lane hy., $3,200,000. Burgess & Niple, 2015 W. 5th Ave., Columbus, consult. engrs. Guy Elbin, co. engr.

▲ **OHIO**—State Hy. Dpt., State Office Bldg., Columbus, Zone 15, ROAD,

Wyandot and Hancock Counties—25 mi. Rte. 23 from Upper Sandusky to Finlay, part of Columbus Toledo Freeway. $22,500,000. Fleck, Quebe & Reid, 1637 N. Illinois St., Indianapolis, Ind., Aldon E. Stilson & Assocs., 245 N. High St., Columbus 15, O., Shaffer, Parrett & Assocs, 672 Logan Rd., Mansfield, O., and Beiswenger & Hoch 1006 Grant St., Akron O., engrs.

▲ **WASHINGTON** — State Hy. Comn., Transportation Bldg., Olympia, ROAD,

Kitsap Co.—freeway on Primary State Hy. 21, west of Bremerton from Sinclair Inlet to Chico. $4,000,000. Constr. 1963.

AIRPORTS

▲ **Miss., Jackson**—City, City Hall, plans by Overstreet, Ware & Ware, 414 S. State, Jackson, Miss., and John L. Turner & Assocs., Petroleum Bldg., Jackson, Miss., 9 story two level 83,000 sq. ft., 160 ft. high concrete brick, TERMINAL, control tower, Jackson Municipal Airport Terminal, $1,265,428, Bids Sept. 8, second RUNWAY, Jackson Municipal Airport Terminal, $1,967,000. E. B. Cavallo & Assocs., Barnett Bldg. and Michael Baker, Jr., Inc., 3957 Northview Dr., Jackson, Miss., consult. engrs. Bids about 2 years. CD 12/31/58.

UNCLASSIFIED

▲ **Colo., Grand Lake**—Shadow Mountain Lodge & Ski Club, Denver U. S. Bank, Denver, plans by Lloyd T. Williams & Assocs., 8646 W. Colfax Ave., Denver, SKI COMPLEX as Shadow Mountain, incl. 100 room lodge, dormitory, warming facility, restaurant, reversible aerial tramway, $2,000,000.

▲ **La., Baton Rouge**—Greater Baton Rouge Port Comn., Port Allen, DOCK FACILITIES. $8,230,000. Barnard & Burk, Inc., 1023 Nicholson Dr., consult. engr.

PUBLIC BUILDINGS

▲ **Ark., Jacksonville**—City, City Hall, bond election Sept. 12, chemical PLANT EXPANSION. $1,500,000. Reasor-Hill Corp., Jacksonville, lessee.

▲ **Calif., Los Angeles**—Bd. Supervs. Los Angeles Co., 500 W. Temple St., plans by J. E. Stanton, W. E. Stockwell, Adrian Wilson, A. C. Martin, 816 W. 5 St., UNDERGROUND PARKING GARAGE in Civic Center Mall, Spring to Grand Ave. and Court House to Hall of Administration. $5,000,000.

▲ **Colo., Denver**—City & County of Denver, City & County Bldg., plans by Reynolds, Ward & Carey, Mile High Center, CITY HALL FIRE and POLICE HEADQUARTERS ANNEX. $6,000,000. CD 3/14/57.

▲ **Ill., LaSalle**—LaSalle Co. Housing Auth., Courthouse, 250 unit SENIOR HOUSING, $3,000,000.

▲ **Ill., West Frankfort**—West Frankfort Housing Auth., City Hall, 175 unit low rental PUBLIC HOUSING, incl. 50 units for elderly persons, $2,500,000.

▲ **Mich., East Grand Rapids**—East Grand Rapids P. Schools, 2018 Wealthy Ave., JUNIOR HIGH SCHOOL. $3,000,000. Bids 1962. CD 3/2/54.

▲ **N. J., East Brunswick**—Bd. Educ. Twp. East Brunswick, 11 Golfview Ave., plans by Nicholas Eckert, 77 Paterson St., New Brunswick, JUNIOR SENIOR HIGH SCHOOL. $1,200,000.

▲ **N. J., Neptune**—Bd. Educ., Neptune Twp., High School, Neptune, plans by Ketchum & Sharp, 227 East 44th St., New York, N. Y., PRIMARY SCHOOL, Western portion, $400,000; INTERMEDIATE SCHOOL, adjoining high school site, $1,000,000. CD 5/22/61.

▲ **O., Bellefontaine**—Bd. Comrs. Logan Co., Courthouse, plans by Philip Q. Partridge, 3307 Clifton Ave., Cincinnati, 40-bed Mary Rutan HOSPITAL ADDN., $1,200,000. CD 10/28/60.

▲ **O., Canton**—Bd. Comrs., Stark Co., Courthouse, vote Nov. 7, levy, HOME for AGED, $1,750,000. CD 8/27/59.

▲ **Va., Charlottesville**—Virginia State Dpt. Educ., State Office Bldg., Richmond, Phase II, MEDICAL CANCER RESEARCH BLDG. ADDN. $920,000, EARTH SCIENCES CLASSROOM BLDG. $700,000. University of Virginia. CD 3/17/55.

▲ **Va., Farmville**—Virginia State Dpt. Educ., State Office Bldg., Richmond, DORMITORY B $700,000, DORMITORY C $700,000, DORMITORY D $700,000, DORMITORY E $700,000, DORMITORY F $700,000; DORMITORY G $700,000, Longwood College. CD 9/28/59.

▲ **Va., Williamsburg**—Virginia State Dpt. Educ., State Office Bldg., Richmond, MEN'S DORMITORY NO. 2, $1,000,000; CLASSROOM BLDG., $798,500.

▲ **Que., Kenogami**—Cite de Kenogami, City Hall, plans by Bertrand Dallaire, 359 St. Dominque, Jonquiere, CIVIC CENTER. $1,000,000.

COMMERCIAL BUILDINGS

▲ **Ala., Mobile**—Fort Morgan Marina, Inc., P.O. Box 1085, plans by Slater & Slater, O'Gwynn Bldg., MOTOR HOTEL, incl. goat docking facilities, restaurant. Over $1,000,000.

▲ **Calif., Hollywood**—Allen E. Siegel, c/o Thunderbird Hotel Corp., 525 N. Sepulveda Blvd., El Segundo, plans by Maxwell Starkman & Assoc., 1100 S. LaBrea St., Los Angeles, Calif., 17 story steel, concrete Hollywood-Thunderbird HOTEL, 8484 Sunset Strip. $9,000,000. Bids January, 1962.

▲ **Conn., Stamford**—Mat-Kar Corp., Bedford St., APARTMENT, Morgan St. $2,140,000.

▲ **Fla., Miami**—First Federal & Savings & Loan Assn of Miami, 100 NE 1st Ave., plans by Connell-Pierce-Garland & Friedman, archts.-engrs., 315 NW 27th Ave., 12 to 14 story, air-conditioned OFFICE and BANK, Flagler St. and SE 3rd Ave. $10,000,000.

▲ **Fla., Miami**—Greater Miami Federal Savings & Loan Assn., 101 SE 2nd Ave., plans by Edwin T. Reeder Assocs., DuPont Plaza Center, 12 story OFFICE ADDN., air-conditioning, heating systems, SE 2nd Ave. $5,000,000.

▲ **Fla., Pensacola**—Sacred Heart Hospital, c/o Hugh Leitch, archt, 2925 Navy Bldg., Pensacola and Shelock, Smith & Adams, archts, 303 Washington Ave., Montgomery, Ala., HOSPITAL. Over $2,000,000.

▲ **Ga., Atlanta**—Phoenix Investment Co. & Taylor Enterprises, 515 Plaster Ave., NE, 150,000 sq. ft., OFFICE, PARKING GARAGE, $3,000,000. Mark Taylor, 515 Plaster Ave., NE, consult. engrs.

▲ **Ill., Bartlett**—Golden Valley Homes, Stearns Rd., plans by Pratt & Vanek, 140 N. LaGrange Rd., LaGrange, 1 story, 100,000 sq. ft., brick Apple Orchard SHOPPING CENTER, $2,000,000.

▲ **Ind., Rensselaer**—Saint Joseph's College, Rensselaer, FACULTY HOUSING, UNION BLDG., $2,000,000. Frank Fischer & Assocs., 608 S. Dearborn St., Chicago 5, Ill., archts. Bids soon.

▲ **Md., Suitland**—Jess Fisher & Co., Inc., 1612 K St. N.W., Wash., D. C., plans by Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, two 8 story, 346 unit APARTMENTS, Suitland Parkway near Branch Ave. and Naylor Rd. $3,633,000.

▲ **Mich., Southfield**—Maccabees Mutual Life Insurance Co., 5057 Woodward Ave., Detroit, Zone 2, plans by Harley, Ellington, Cowin & Stirton, Inc., 153 E. Elizabeth, Detroit, OFFICE, Northwestern Hy. and 10½-Mile Rd. $2,000,000. CD 6/30/61.

▲ **N. J., Belleville**—Krugman & De Petro, 1330 Main Ave., Clifton, 5 story, 320 units APARTMENTS, Fairview Ave. $2,500,000.

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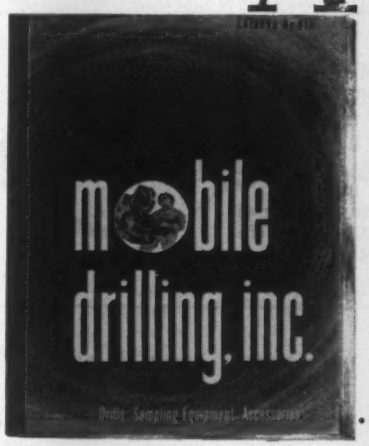

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PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6"	55	2000	200
G-70E	6"	72	5400	180
G-120A	6"	110	3500	105
G-160	6"	150	2750	82
I-200	8"	210	2000	54
FR-300	8"	325	1250	54
J-400	8"	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10"	600	600	60
KG-725	10"	800	490	69
N-500	10"	425	1100	30
N-750	11"	(c)600*	1000	30
		(a)700		
P-1000	12"	1200	1000	46
R-1500	14"	1800	700	65
T-2000	16"	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

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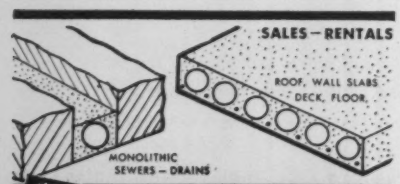

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Without the zone number addresses are incomplete in 106 U. S. cities.

▲ **N. J., Palisades Park**—Krugman & De Petro, 1330 Main Ave., Clifton, plans by C. J. Kordys, 1379 Hamburg Turnpike, Wayne, 20 story APARTMENT off Central Ave. at 14th St. $20,000,000.

▲ **N. Y., New York**—Herkimer Industries, Inc., (Louis Robbins in charge) 400 Madison Ave., Zone 14, OFFICES and STORES, 24 E. 67 St. $5,000,000.

▲ **O., Alliance**—Catholic Diocese of Youngstown, 114 W. Wood St., Youngstown, CATHOLIC HIGH SCHOOL, Nimashhillen Twps. $1,000,000. CD 12/23/59, under O., Canton.

▲ **O., Cincinnati**—Orthodox Jewish Home for Aged, c/o A. Harris, chn., 609 Walnut St., plans by F. E. Betz Assoc., Kroger Bldg., and Benj. Dombar, 2436 Reading Rd., assoc. archt., 2 story, brick, bsmnt. HOME FOR AGED, Paddock and Towne Ave. $1,300,000. CD 5/27/59.

▲ **Tex., Wichita Falls**—Ram Building Co., 816-17th St., 86, one story, brick veneer DWELLINGS, Lincoln Heights. $1,088,000.

▲ **Va., Fairfax**—United Investors, 1411 K St. N.W., Wash., D. C., plans by Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, Md., 12 story, 266 units APARTMENT, Munson Hill Towers. 2,600,000.

▲ **Va., Leesburg**—United Investors, 1411 K St. N.W., Wash., D. C., 12 story, 267-unit APARTMENTS, adjoining Seven Corners Shopping Center. $3,500,000. Bids in Fall.

▲ **Wis., Brookfield**—Jared Corp., 735 North Water St., Milwaukee, SHOPPING CENTER. $5,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Fontana**—Southern California Edison Co., 500 W. 5 St., Los Angeles, 4th Unit, 310,000 kw. Etiwanda STEAM PLANT ADDN. $37,000,000. Applied for permission to build to California Public Utilities Commission.

▲ **Calif., Fresno**—Del Hershey Contr. Co., 2609 E. McKinley Ave., plans by Haulman, Dyer, Faller Assoc., Inc., 2809 N. Blackstone Ave., T-shaped, 2 blocks long, 1200-car air conditioning UNDERGROUND GARAGE, escalators, commercial facilities under Van Ness Ave., between Fresno and Tulare Sts. $2,000,000. City of Fresno, lessee.

▲ **Conn., Wallingford** — American Cyanamid Co., S. Cherry St., PLANT for production of methyl methacrylate molding powder. $2,000,000.

▲ **Md., Cumberland**—Hercules Powder Co., Allegheny Ballistic Laboratory, Rocket City, W. Va., plans by Mills, Petticord & Mills, 3308 14 St. N. W., Wash., D. C., LABORATORY-OFFICE, SEWAGE TREATMENT PLANT and WATER SUPPLY. $3,500,000. Bids Nov. 1961.

▲ **N. Y., Depew**—J. W. Clement Co., 8 Lord St., Buffalo, plans by Edward B. Reed, 775 Main St., Buffalo, 400,000 sq. ft. FACTORY. $5,000,000-$7,000,000. Bids 1961.

▲ **Tex., Victoria**—Central Power & Light Co., 120 N. Chaparral St., Corpus Christi, 175,000 watt STEAM GENERATING electric POWER PLANT, $12,000,000; ELEC. POWER TRANS. LINES, $750,000; grounds and EARTHWORK, for power plant area, $150,000; MACHINE REPAIR SHOP, $200,000; rein.-con., steel FOUNDATION for power plant, $400,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., engrs. for all units. CD 2/1/61.

▲ **Que., Baie Comeau**—Canadian British Aluminum Co., Ltd., 1100 Sherbrooke St. W., Montreal, ALUMINUM PLANT EXTENSION, $36,000,000. C. D. Howe Co., Ltd., 1421 Atwater Ave., Montreal, consult. engrs. CD 4/30/56.

▲ **Sask., Esterhasy**—International Minerals & Chemical Corp., 5401 Old Orchard St., Skokie, Ill., U.S.A., POTASH MINE, PLANT ADDNS. $10,000,000.

AMERICANS ABROAD

▲ **Sweden, Stenungsund**-Uni-Kemi A/B, subsidiary Union Carbide Corp., 270 Park Ave., New York, N. Y., U. S. A., and Stockholms Superfosfat Fabriks A. B., Carrelgatan 1, Box 5052, Stockholm 5, POLYETHYLENE PLANT. $9,650,000. Bids Fall 1961.

LATIN AMERICA

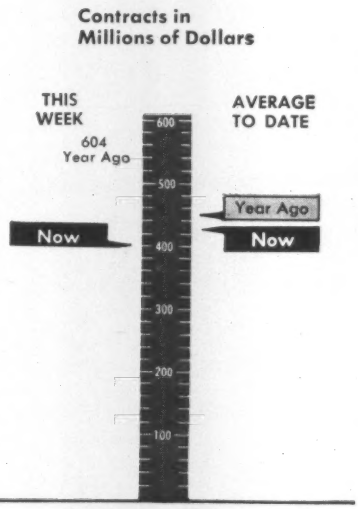
▲ **Chile, Santiago**—Dpt. Agriculture, Ministry P. Wks., Santiago, will accept registrations from interested contractor until Aug. 16 for constr. TERMINAL BLDG., CONTROL TOWER, FREIGHT HANDLING BLDG., HANGAR, SHOPS, PUMPHOUSE, etc. at Pudahuel Airport, $3,000,000. CD 7/17/59.

▲ **EL SALVADOR**—National Economic Coordination & Planning Comn., San Salvador, ROADS, 4 year plan highway constr.; reconstr. Acajutla-Sonsonate-San Salvador Hy.; Secondary Hy. from Santa Ana to Honduran Border at Anguiatu. $12,176,000. Tippetts-Abbett-McCarthy-Stratton, Inter-American Corp. (TAMS), 375 Park Ave., New York, N. Y., U.S.A., consult. engrs.

▲ **French West Indies, Guadeloupe**—Societe d'Equipment de la Guadeloupe, Monsieur Roger Bac, dir., Boite Postal 360, Pointe-a-Pitre, Guadaloupe, HOUSING, INDUSTRIAL and PORT DEVELOPMENTS for Pointe-a-Pitre, Est. cost $30,000,000; DEVELOPMENT of Island of Marie Galante, Est. cost $10,000,000.

Construction Scoreboard

This Week...



AMOUNT OF CONTRACTS LET

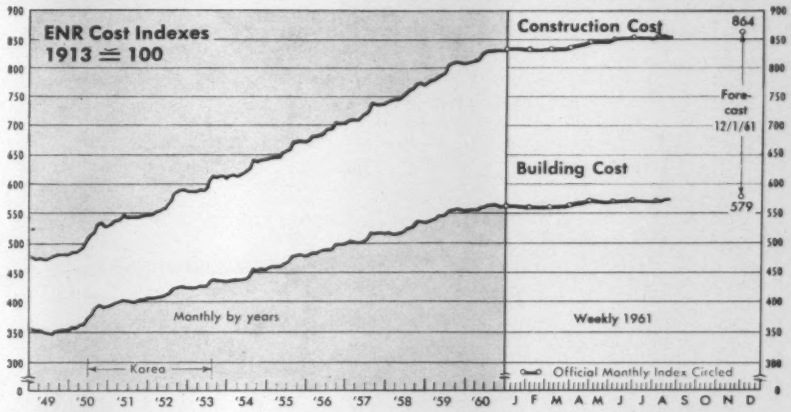
Contracts Awarded In 50 States By Type	This Week	Cum. 35 wks 1961	Chge '60-'61 %
	millions		
All Heavy Construction	$402.1	$15,032.9	− 4
By Ownership			
PRIVATE	231.3	7,283.9	−12
PUBLIC	170.8	7,749.0	+ 6
State & Municipal	155.2	5,948.3	+ 6
Federal	15.6	1,800.7	+ 7
By Type of Work			
PUBLIC			
Waterworks	3.3	269.5	−15
Sewerage	31.3	501.9	+25
Bridges*	11.0	450.1	−20
Highways	70.6	2,596.1	+14
Earthwork Dams & Waterways	6.2	577.0	+ 5
Buildings:			
Excl. Housing	36.0	1,827.0	+10
Housing	6.3	584.5	+23
Unclassified	6.1	943.4	−10
PRIVATE			
Buildings:			
Mass Housing	121.6	3,300.2	−18
Commercial	52.8	1,787.9	+ 6
Industrial	52.2	1,899.4	− 4
Unclassified	4.7	295.9	−53

* Includes Private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Aug. 24	Cum. 34 wks 1961	Chge '60-'61 %
	millions		
Corporate Securities	$ 1.8	$ 2,270.6	+16
State and Municipal:			
All Except Housing	179.5	4,522.7	+ 1
Housing	3.2	97.8	−47
Federal Loans	0	183.7	+58
Federal Aid	0	2,990.6	+10
Total Nonfederal	$184.5	$10,065.4	+ 6
Federal Appropriations:			
Projects in U. S.	0	268.7	−80
Outside U. S.	0	2.3	−99
Total New Capital	$184.5	$10,336.4	− 6



ENR INDEXES (1913=100), 20-cities' average	Week of Aug. 24 1961	% Change from July 27 1961	% Change from Aug. 25 1960
Construction Cost	854.16	+0.1	+2.9
Building Cost	571.49	+0.1	+1.6

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest month...

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	July 1961 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$125,139	+0.02	+1.8
By Ownership—			
Private	57,090	+0.9	+3.4
State & Municipal	54,402	−0.5	+1.6
Federal	13,647	−1.5	−3.4
By Type of Work—			
Waterworks	3,124	−0.1	+9.2
Sewerage	4,314	+1.1	+10.5
Bridges	3,172	−2.2	−4.7
Highways	13,126	−1.2	−4.0
Earthwork, Dams and Waterways	11,957	−0.3	+0.9
Public Buildings	22,678	−0.6	+2.1
Industrial Buildings	17,940	+2.8	+1.3
Commercial Buildings	28,276	−0.1	+5.3
Unclassified, Private	10,874*	+0.1	+1.9
Unclassified, Public	9,678	−1.0	−1.7

* Includes Private Bridges, $101 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1961 July (millions)	1961 7-months (millions)	Percent Change from 1960 July	Percent Change from 1960 7-Mos.
Total U. S. (ENR reported)	$1,547	$12,084	+19	−11
By Ownership—				
Private	1,118	6,994	+63	− 9
State & Municipal	418	4,688	− 2	− 7
Federal	11	402	−94	−55
By Type of Work—				
Waterworks	26	470	+215	+129
Sewerage	95	549	+73	+45
Bridges	6	165	−27	+ 5
Highways	25	702	−79	−58
Earthwork, Dams and Waterways	20	315	−42	+120
Public Buildings	202	2,537	−37	− 5
Industrial Buildings	588	2,352	+314	+18
Commercial: Mass Housing	170	1,873	−45	−47
Other Building	219	2,122	+16	+21
Unclassified, Private	141	647	+209	+53
Unclassified, Public	55	352	−27	−52

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	1,020	6,691	+ 8	+ 1
By Ownership—				
Private	257	2,471	−30	− 6
State & Municipal	561	3,120	+23	+ 8
Federal	202	1,100	+66	+ 1

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* * *

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Joe started out to be a doctor, turned carpenter when his older brother, the family bread-winner, was killed in an accident. He soon found out he was interested in the business of building and within ten years had not only built a good number of buildings but a reputation as a pioneer in concrete construction.

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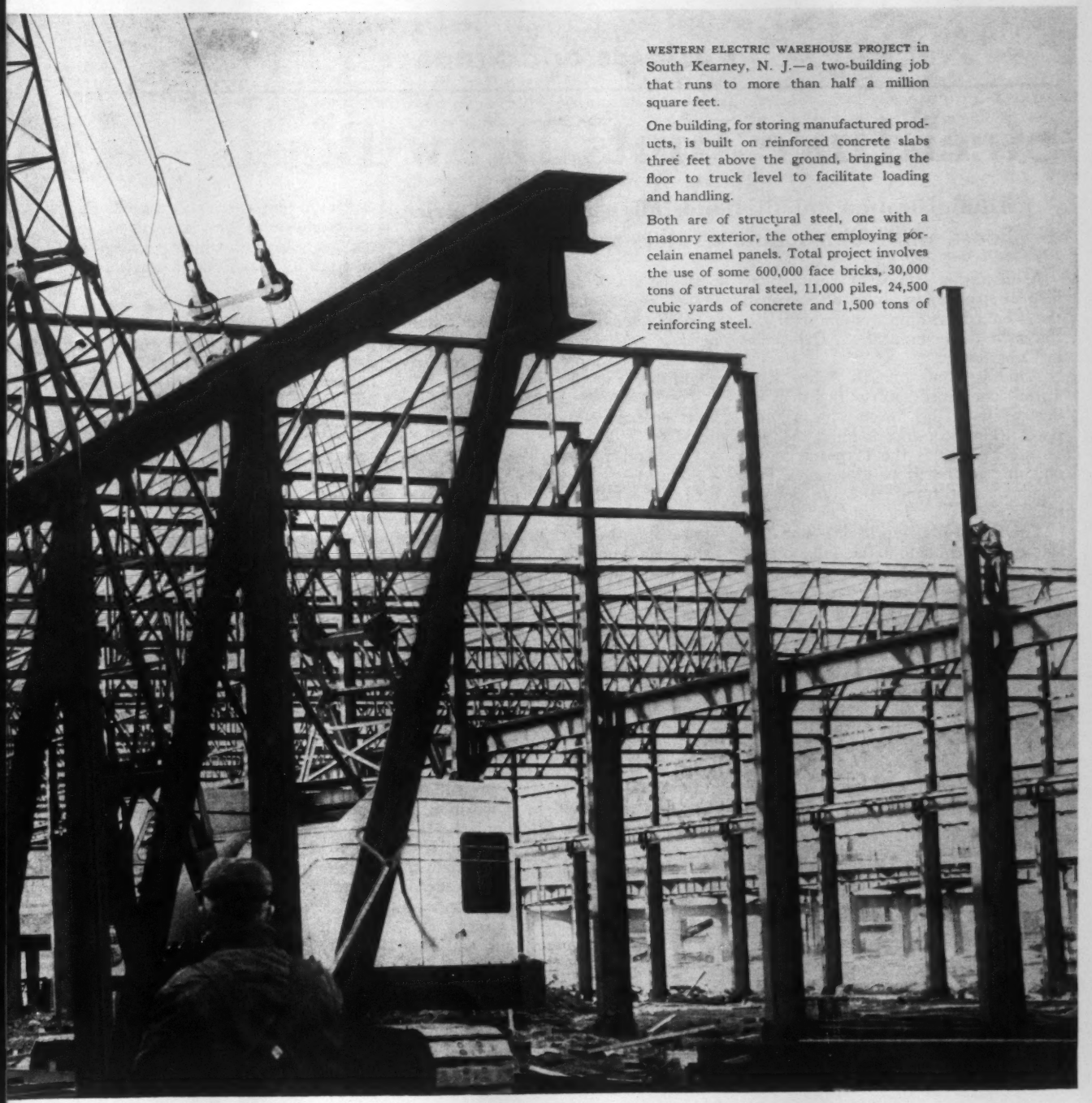

WESTERN ELECTRIC WAREHOUSE PROJECT in South Kearney, N. J.—a two-building job that runs to more than half a million square feet.

One building, for storing manufactured products, is built on reinforced concrete slabs three feet above the ground, bringing the floor to truck level to facilitate loading and handling.

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Steel-Hike Hints Draw Blasts

Administration quietly builds offensive against price boost, while Democratic senators are more vocal

A mounting campaign against any hike in steel prices builds up steam in the Kennedy Administration with enthusiastic help coming from Democrats in Congress.

Administration officials "view with alarm" continued talk in the steel industry about the "need" for a price boost. They consider holding the line on steel prices as the barricade to restraining any inflationary pressures, that might develop from the Berlin defense build-up.

The Berlin build-up itself is not considered big enough to be inflationary, but more and more signs point to a vigorous economic recovery. These factors combined give Washington officials the jitters.

Last week a dozen Democratic senators, led by Tennessee's Albert Gore, took to the Senate floor in concert. They said they would consider a price boost dangerous and unjustified. Fearing the steel companies will raise prices after Congress adjourns, they want to get their say in first. Armed with statistics from the President's Council of Economic Advisers and Sen. Estes Kefauver's anti-trust subcommittee, the Democrats hammered at the theme that a steel-price increase could trigger an "inflationary binge."

So far the President has said little about a possible price rise. Congressional Democrats openly concede disappointment in his failure to join in their verbal-attack. They even wonder whether the Administration is sufficiently concerned; no expression comparable to Secretary of Labor Goldberg's assertion that an auto strike would be "intolerable," yet blares at the steel industry. The Administration apparently wants to avoid prejudging a situation. Nevertheless it recognizes that steel prices are basic. Eventually its voice may be heard, probably next month.

The statistics cited by the senators claim the industry can absorb this year's two wage increases (the second of 7.8 cents an hour set for October), without a price boost and still make a fourth-quarter profit of 10-12% after taxes. This equals the average for the last 14 years. The profit estimate also assumes the steel industry will be operating at 80% of capacity during the quarter with the aid of defense orders and the natural course of recovery.

While senatorial talk alone cannot block a price hike, the senators point up the opposition the steel industry might face if it tries to raise prices.

The Administration and Congress have several weapons at their command.

First and probably most important—public pressure exerted by the President. The Council of Economic Advisers has been studying prices and profits for months and can be expected to furnish ammunition.

Second, the Federal Trade Commission and the Justice Department might move in. A 1951 FTC order against the big steel companies to "cease and desist" from price fixing or exchanging price information still operates, and under the new chairman, Paul Rand Dixon, it might be brought into play. Similarly the Justice Department under Attorney General Robert Kennedy could try an anti-trust action.

Senator Gore asserts that any uniform price increase would be a violation of the 1951 cease-and-desist order. FTC officials however, wonder about this. They would have to prove collusion or conspiracy. Steel company officials won't be caught in a hotel room discussing prices as were the electric company officials. Whether a uniform price increase itself could provide enough evidence of collusion remains an open question in anti-trust law. "A concerted price hike would be a real problem for us," says an FTC official.

Third, and not so frequently mentioned, looms the possibility of action by Congress on a bill requiring prior notification of all price increases in basic industry. Congress continues its avoidance of this bill sponsored by Senator Kefauver. A price boost, however, might revive hearings on the bill at least.

Reports also circulate that steel industry leaders got a warning that if they expect any support from the Administration next year when contract negotiations come up again, they had better not raise prices.

Senator Gore charged that a publicity build-up for a price hike has already begun. Steel executives, he asserted, use trade publications as a medium of communications "in their mock sparring to determine which company will take the lead, and how far it is safe to push up the price."

He compared the "ritual,"—which he said occurred before the 1958 price hike, too—with "the mating season dances of the gooney birds." He says he sees signs indicating that a $5-ton increase will follow the Oct. 1 wage increase "unless something is done to restrain such action."

The Senator also spoke boldly about bringing steel under "utility type regulations" as a last resort. This threat, however, rates as wind; no one in Washington considers such drastic action even remotely possible or under consideration.

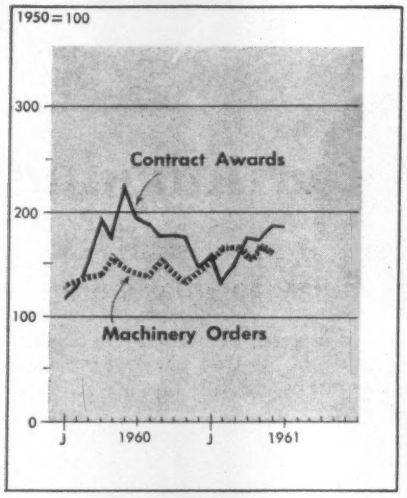
The attack by the senators, while not initiated by the Administration, did get an Administration blessing.

A group of 20 Democratic senators planned the attack at a dinner meeting three weeks ago. There, Otto Eckstein of Harvard, who made a study of the steel industry for the Joint Economic Committee, convinced the senators that a price hike at this time lacks economic justification.

For one thing, U.S. exports already lag because of high prices. From 1953 to 1958, Senator Gore reports, steel export prices rose 20% more than prices of foreign competitors, while the U.S. share of world markets fell from 18% to 12%.

The anti-trust subcommittee study—based on Professor Eckstein's work—asserts that the annual productivity increase of 3% a year covers the wage increases currently involved, while allowing a 10.5% rate of return on investment in the fourth quarter. The steel industry disputes the productivity figures, and adds that the significant profit figures are rate of return on sales, not investment; on this basis the steel industry shows a much lower profit margin.

Subcommittee figures also claim past price increases on steel have been substantially greater than those in other sectors of the economy. The increase in the price of finished steel was three times as great as the all-commodity index from 1956 to 1960. However, from 1958 to 1960, some products—textiles, leather, lumber, machinery—registered bigger wholesale price increases than finished steel.



Equipment Makers Report 4% Dip in June Orders

Construction equipment orders dipped 4% in June, but topped June 1960 by 7%, according to the McGraw-Hill Economics Department index. The index is based on reports from cooperating companies representing a sample of the construction equipment industry.

The latest value was the third highest June on record and the eleventh consecutive month to top the year-ago volume. The June index value of 158, is based on average 1950 monthly volume as 100. Orders for the first six months average 166, an 11% increase over last year's first half.

By contrast, ENR's Heavy Construction Contract Index rose in June while the six-month average slipped 2%. In July, the Contract Index slid 6% from a year earlier. The seven-month average of 166 is 2% below last year's first seven months. The Contract Award Index is also based on 1950 as 100.

U.S. Backs Coordinated Highway-Land Planning

The federal government backed with cash its recently announced intention to achieve coordinated planning for highways and urban development.

The Housing and Home Finance Authority will grant $150,000 to the Southeastern Virginia Regional Planning Commission as a starter for a highway-redevelopment planning program. With the grant, the program becomes the first one under the policy for coordinated planning.

Total cost of the study will be $550,000–$300,000 for the master land development program and $250,000 for highway planning in the area. The HHFA will pay half the cost of the land usage study and the Bureau of Public Roads half of the highway planning study.

Florida Engineers Get Tax Break

A new Florida law gives professional engineers licensed in that state a tax bonanza; effective tomorrow, all professional people can incorporate themselves as individuals.

So far, however, engineers apparently choose to ignore the potential tax-breaks the individual corporate set-up can provide. State officials reported this week that not one consulting engineer licensed in the state has filed incorporation papers.

Under the law, an engineer practicing individually, will be permitted to form his own corporation. He can serve as its board chairman, president, treasurer, secretary and also the only employee.

The individual professional engineer who controls—and is—the corporation can thus elect any salary within his earning capacity and personal needs. He then can pay individual or corporation income taxes, in combination or separately, at a rate that will keep tax liability at a minimum.

In addition, the law allows the one-man corporation to place up to 15% of annual earnings in a profit-sharing fund and 10% in a pension plan. The combined total can be deducted from taxable income. Moreover, income received from the funds so invested would not be taxed currently. On retirement the funds withdrawn would be taxed, but at the maximum capital gain rate of 25%. And should the individual die, the accumulated fund can pass to a designated beneficiary without payment of estate taxes.

And if the professional has a secretary or other assistants, he can pay their medical expenses which would be a corporate tax deduction but not taxable income to the employee. Group life insurance premiums for employees also would be a corporate tax deduction.

The Internal Revenue Service refrains from commenting on the measure. State officials, however, privately believe that the tax-break provisions will eventually be questioned—and tested—when income tax time rolls around next year.

U.S. Snipes at Two Consultants

The U. S. Internal Revenue Service has filed tax and penalty claims totaling $197,632 against Brighton Engineering Co. of Frankfort, Ky.

The action makes Brighton the second Frankfort-based consulting engineering company to be placed under government scrutiny. Last year, during the Eisenhower Administration, the Bureau of Public Roads quietly announced that it would no longer approve Interstate highway designs of Tecon Engineers, Inc.

A BPR investigation of Tecon reportedly still continues. Meanwhile the Bureau still withholds approval of Tecon design contracts.

Although the companies now operate as separate entities, the headaches of both apparently stem from an earlier common ownership. Tecon formerly owned Brighton, and Tecon is owned by William H. May. Mr. May, a financial supporter of Gov. Bert T. Combs' gubernatorial campaign, sold Brighton in October 1959, but retained ownership of Tecon.

Tecon, until BPR's action, reportedly designed Interstate highway projects worth $250 million. Mr. May, who is not an engineer, reports federal-aid road jobs represented only about 25% of Tecon's work. Industrial projects in the U. S. and Latin America and highway and industrial projects in Latin America comprise Tecon's largest volume, Mr. May says.

In the Brighton Engineering action, the government seeks taxes of $46,013 for the year ending Feb. 28, 1957, plus a 50% penalty of $23,001. For 1958, taxes allegedly due total $85,741, with the penalty of $42,870 bringing the total for that year to $128,611.

According to the IRS, $58,920 in professional fees claimed by Brighton were not ordinary and necessary business expenses. The bureau also disallowed another $38,950 in salaries for the same reason. Other deductions disallowed include $10,433 spent by Mr. May, who headed Tecon when it owned Brighton, and $11,690 for entertainment, lodging and transportation of public officials.

Former Gov. Lawrence Wetherby, now a vice-president and major stockholder in Brighton predicts the case will be settled out of court. Mr. Wetherby, who is not an engineer, says Brighton's troubles stem from its former ownership by Tecon. At various times during 1952 to 1958, Tecon hired several state legislators who received the payments now being disallowed by the federal government.

Mr. Wetherby had no business or financial connection with Tecon or Brighton. He bought into the company only this summer, purchasing all but 10% of a one-third interest held by Kentucky State Auditor Joseph W. Schneider.

Mr. May, who owned Brighton through Tecon, admits that the parent company hired four members of the state assembly. He emphasizes the tax case involves no criminal fraud.

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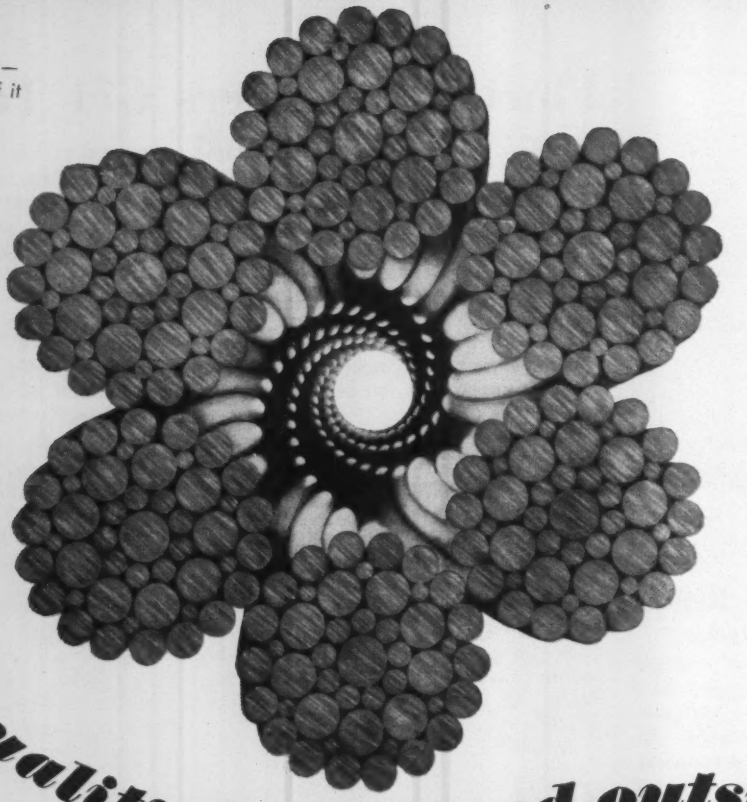
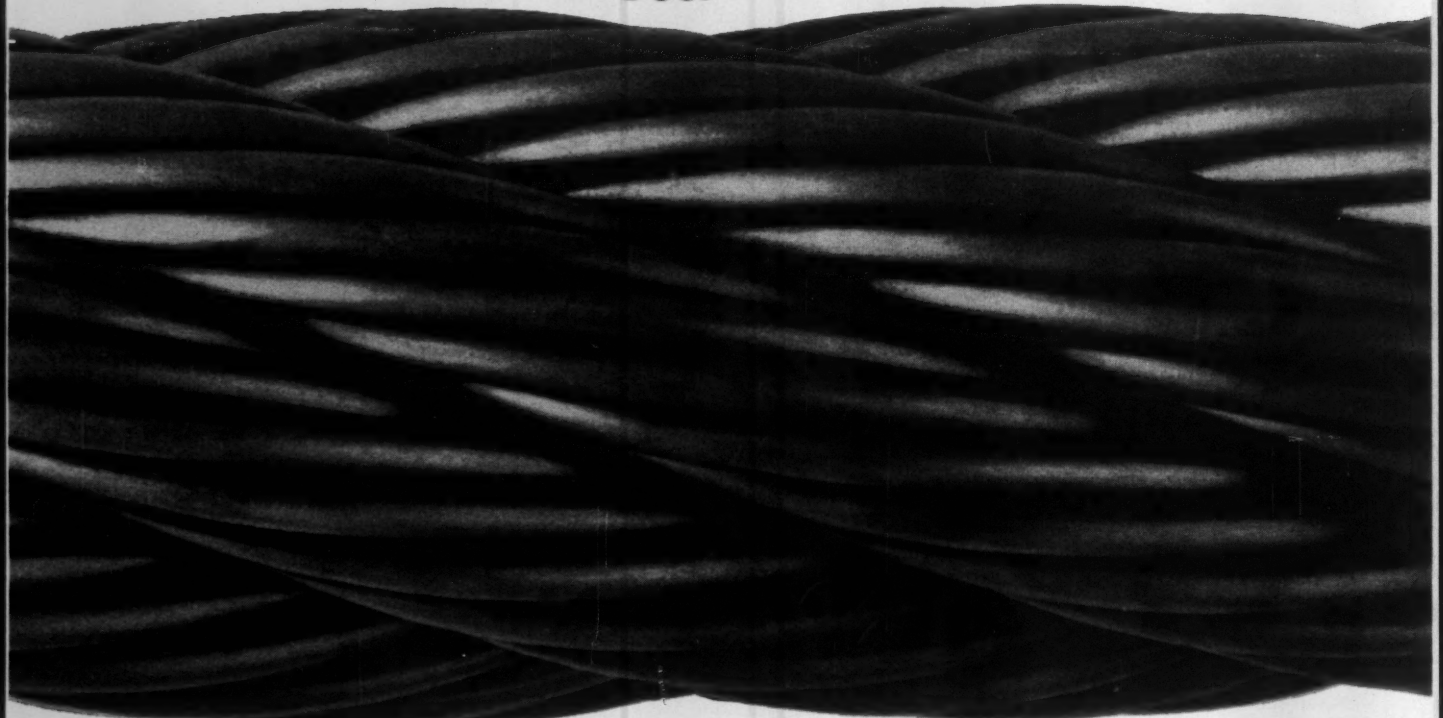
You get a lot of work out of it



Quality inside and outside



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Subcontractor Clauses Breed Confusion

Court decisions leave contractors in the dark as to the legality of strikes to obtain the clauses

The Landrum-Griffin labor law has been on the books for nearly two years but what some of it means is still anyone's guess.

Latest indication of one of the resulting dilemmas for unions and employers in the construction industry is the inability of the courts to agree on how industry's hot cargo exemption works.

Some courts say it does not allow a union to strike to get or enforce a subcontractor clause in collective bargaining agreements. Others argue that Congress did not intend to ban strike pressures for such purposes. Part of the confusion comes from the long arm of the Denver Building Trades case, which the situs picketing bill would reverse.

When the Landrum-Griffin law was passed, it banned hot cargo agreements, which it described as those under which an employer agrees not to handle the products of another employer, or to cease doing business with another person. The ban does not apply to construction agreements covering contracting or subcontracting of on-site work.

A typical subcontractor clause—and the kind featured in current litigation—requires that subcontractors meet the wages and other working conditions of the union's labor contract with the general contractor.

Landrum-Griffin sponsors denied any intent to change "existing law with respect to judicial enforcement of these contracts or with respect to the legality of a strike to obtain such a contract."

The issue came up before the Circuit Court of Appeals for the Ninth Circuit in San Francisco last month in a case involving a local of the operating engineers. The union had a subcontractor clause with contractors who were working for land development companies. The union claimed that two civil engineering and surveying firms doing survey work for the development companies were paying less than union wages in violation of the subcontractor clause. It struck several projects.

The court ruled that the strikes were illegal secondary boycotts. Although the Landrum-Griffin law validated the subcontractor clause, it said, "it goes no further than according such clauses validity. The proviso does not legalize strikes or other coercive pressure to enforce such clauses."

Earlier in the year, the U. S. District Court for the Eastern District of Louisiana came up with a different answer. It refused to grant an injunction against the picketing of a plumbers local that was accused of trying to force a construction firm to sign a subcontractor agreement.

The court presented this argument: Striking to obtain a subcontractor clause was legal under the Taft-Hartley Act and is still legal. The Landrum-Griffin law preserves the legality of such clauses and denies a union "its traditional weapons" only when used "to secure an illegal agreement." The Supreme Court has merely held (in the Sand Door case) that such agreements cannot be enforced by secondary boycotts; it did not ban other lawful activity to persuade a contractor to enter into such agreements.

This reasoning has appealed to the U. S. District Court in Arizona which was asked to enjoin a laborers strike. The union was trying to get a general contractor, whose workers it did not represent, to sign an agreement containing a subcontractor clause.

The court said that subcontractor clauses are legal whether entered into voluntarily or involuntarily and that it is not an unfair labor practice to use pressure to obtain them. It did, however, grant the injunction on other grounds, namely that the union violated the Landrum-Griffin restrictions on organizational picketing and engaged in a boycott to force employers to recognize an uncertified union.

Last month, the Federal District Court in Minnesota said this line of reasoning on subcontractor clauses is "not persuasive."

There, the court was faced with collective bargaining strikes by a laborers local against members of a home builders' association. The strikes were aimed, the court said, at obtaining a labor contract clause prohibiting the subcontracting of on-site work to any subcontractor who "fails in writing to comply" with the employment conditions of the labor contract with the home builders. The strike had shut down work of various subcontractors and had halted some deliveries.

The court categorically stated that the Landrum-Griffin law bans "strike pressure to obtain" a subcontractor clause. The court explained that Congress may have legalized subcontractor clauses voluntarily entered into, but it did not legalize strikes to get them because it did not exempt construction unions from the secondary boycott provisions of the law as interpreted by the Supreme Court in the Denver case.

Pennsylvania Changes Wage Law

Contractors and subcontractors doing construction, reconstruction, demolition and maintenance work for the Commonwealth of Pennsylvania, or any of its political subdivisions, will have to pay prevailing wages and fringe benefits after January 31, 1962.

Under the new measure, signed into law this month by Gov. David L. Lawrence (D), contractors can be blacklisted for willful violations.

The law's coverage is broad. It embraces all contracts in excess of $2,000 for public works of the Commonwealth, boroughs, townships and school districts, as well as those of any instrumentality or agency of the Commonwealth.

The Secretary of Labor and Industry will administer the act and determine the rates to be written into public contracts. The secretary, in making wage determinations, is required to take into account minimum wages in collective bargaining agreements, including benefit provisions of union contracts.

Each contractor must "keep an accurate record showing the name, craft and the actual hourly rate of wage paid to each workman employed by him in connection with the public work." These records must be preserved for two years from the date of payment and kept open for inspection by the public body that awards the contract.

The law provides for the review of wage determinations, on request, and for worker protests of underpayments. Wages due may be deducted from the final payment on the contract.

In signing the legislation, Governor Lawrence said it "protects fair-minded employers against unfair competition in submitting bids for public contracts and protects workers from wages below prevailing minimum standards."

Wage Changes Become Effective Sunday

When the 1961 amendments to the Fair Labor Standards Act go into effect next week, some employers in the construction industry may find themselves operating with a double wage standard.

Commencing September 3, employees covered under the old minimum wage law must be paid not less than $1.15 an hour, plus time and a half their regular rate for overtime in excess of 40 hours a week. The rate goes up to $1.25 on September 3, 1963.

Newly covered workers will be entitled to at least $1.00 an hour, but premium payment for overtime will not be required until September 3, 1963. These workers will not get the full protection of the law until September 3, 1965.

The U. S. Labor Department's Wage and Hour and Public Contracts Division warns that some employers will have employees in both groups.

Newly covered workers are those who come under the law through the "enterprise" test, which was introduced for the first time by the 1961 amendments.

Under the new law, minimum wage protection has been extended to all employees in any "enterprise engaged in the business of construction or reconstruction, or both, if the annual gross volume from the business of such enterprise is not less than $350,000" and if the enterprise is "engaged in commerce or in the production of goods for commerce."

The law defines an "enterprise" as the "related activities performed (either through unified operation or common control) by any person or persons for a common business purpose." It is immaterial whether the activities are performed by one or more establishments, by one or more departments, or by one or more corporate units.

Unrelated activities, which occur in the case of a common ownership of different businesses, are treated as separate enterprises. And the work performed by independent contractors is not a "related" activity. The Labor Department, however, is taking the position that the work performed for a general contractor under subcontracts is not excluded in computing the general contractor's business volume.

Unlike the old law, whose ticklish coverage test is still preserved, the new law attempts to define "commerce." An "enterprise" is deemed to be in commerce, or producing goods for commerce, if it has any employees in interstate commerce, including employees "handling, selling or otherwise working on goods that have been moved in or produced for commerce by any person."

Under the new law, "nonenterprises" are still governed by the old coverage tests. For the purposes of the construction industry, this group includes those that do not meet the new $350,000 test.

Coverage of employees in nonenterprises is determined, not by the nature of the employer's business, but by the type of work performed by the employee. In these cases, covered employees are those engaged in interstate or foreign commerce or in the production of goods for commerce, including those in any closely related process or occupation directly essential to such production.

Unlike the situation under the new law, only the employees that meet this test are covered. And in applying the test, employers will still have to go back to the mass of litigated cases, including the Vollmer decision, to determine when an employee is "engaged in commerce."

Goldberg Rejects Powell Bill

Labor Secretary Arthur Goldberg implicitly took the position last week that administrative action is preferable to a legislative shotgun attack on racial discrimination in apprenticeship training.

In a letter to Rep. Adam Clayton Powell (D., N.Y.), who heads the House Education and Labor Committee, Mr. Goldberg said the Department of Labor "supports fully the objectives" of the apprenticeship bill Mr. Powell has introduced.

"I am in complete agreement with you," he wrote, "that there be no discrimination in apprenticeship programs." He pointed out, however, that positive steps in that direction are now being taken on the administrative front through the President's Committee on Equal Employment Opportunity and through his own directives (ENR, Aug. 24, p.80).

The Powell bill would bar federal sponsorship of discriminatory training programs and would effectively ban use of apprentices on federal construction projects unless the apprentices are enrolled in nondiscriminatory training programs. Hearings on the bill commenced last week.

Mr. Goldberg, however, did not retract the earlier testimony of two of his assistants—Jerry Holleman, an assistant secretary, and Edward Goshen, director of the Federal Bureau of Apprenticeship and Training.

Mr. Holleman and Mr. Goshen had questioned the wisdom of the Powell bill, particularly in view of the anti-discrimination action that is being taken on other fronts. They suggested that it would be costly and perhaps impossible to police or administer the bill, and that legislative action might retard the development of urgently needed apprenticeship, which is a voluntary endeavor.

Mr. Goldberg said "apparently the Department of Labor testimony . . . has not been fully understood." He offered his cooperation "in perfecting" legislation to meet the problems under consideration.

In the meantime, AFL-CIO President George Meany, who endorsed the bill, served notice in his testimony that unions should not be made the scapegoats of discrimination. Pointing out that employers cannot escape their legal responsibilities, he said:

"Apprenticeship training programs are not union programs. They are jointly administered by labor and management. The apprentices work for the employer. They are paid by the employer. Their candidacy as apprentices is usually proposed and is always accepted or rejected by the employer."

Construction Employment Shows Substantial Gain

The job situation continued to improve in construction and durable goods manufacturing in July. But the seasonally adjusted rate of unemployment, now at 6.9%, remained practically unchanged for the eighth straight month.

In its monthly report on the labor force, the U. S. Labor Department said that construction employment rose by 100,000 over the month and hit 3,131,000 in July. The total is 33,000 higher than it was a year ago.

The Department called the July increase "better than seasonal." It said construction employment during the last few months has been "picking up at a substantially better rate than usual for this time of year."

Labor in Brief . . .

• **AFL-CIO peace?**—A special committee of the AFL-CIO has reportedly agreed on the draft of a peace plan for settling jurisdictional disputes between the building trades and industrial unions. The plan, not yet disclosed, will be presented to the AFL-CIO Executive Council at its October meeting and will presumably be put before the upcoming departmental and federation conventions.

• **Strike settled**—An eight-week strike of ready-mix, sand and gravel teamsters in New York City ended last week with a new two-year labor contract. The agreement gives the teamsters a 50-cent increase, divided at the union's option between wages and welfare and pensions, and grants three days' sick leave a year. A modified job security clause is included.

• **Ousted**—Settlement of the 10-week old electrical workers strike in Baltimore, Md., has run into another obstacle with the revocation of the local union's charter by the International Brotherhood of Electrical Workers, which contends the strike is illegal, because it is not authorized by the international. The trouble started when the local refused to use the electrical industry's disputes settlement machinery.

• **Prevailing wages**—The Chamber of Commerce plans to set up a Davis-Bacon watchdog committee. Using the services of contractors and state and local chambers, the committee will publicize improper wage determinations, contest deviations from the law and explain the "need" for repeal of the Davis-Bacon Act.

• **Inflation as an issue**—In a move that could affect collective bargaining generally, the United Auto Workers Union last week filed unfair labor practice charges against General Motors for refusing to supply data on its price-profit formula. The union claims GM made this a "central issue" by raising the question of inflationary wage increases.

• **Teamster defections**—Four Cincinnati, O., teamster locals, none of them in the construction industry, are trying to secede from the International Brotherhood of Teamsters.

• **Safety**—Stirred by seven fatalities in trench cave-ins in less than two years, New Jersey Department of Labor and Industry has added four more inspectors to its construction safety field force. "Where we find violations, we intend to prosecute," warns Commissioner R. F. Male.

Missile Unit Curbs Kansas Rates

The Missile Sites Labor Commission, created by President Kennedy three months ago, has returned its first finding that wage rates paid at a missile site construction project are unreasonable.

The Commission ruled after an inquiry requested by the Secretary of Defense that certain wage scales at missile-launching sites around Forbes Air Force Base, near Topeka, Kan., are unduly high. The rates, fixed in an agreement between Local 142 of the International Hod Carriers Union and the Topeka division of Associated General Contractors, apply to work performed by general laborers, mason tenders, mortar mixers, concrete saw operators, sand and concrete gun nozzlemen and powdermen.

The Commission found that normal wage rates for construction in counties surrounding Topeka where the missile sites are located are as much as 13% below rates paid in Topeka itself. But the union and companies agreed that the higher Topeka rate would apply on federal projects.

The Commission recommended that the Defense Department disallow the excess cost under the cost-plus contracts covering the missile site work. But it said the disallowance should apply to future payments rather than to costs incurred before its ruling.

In another case, the 11-man Commission, which is headed by Labor Secretary Arthur Goldberg, found after an inquiry requested by the Defense Department that wage rates for construction at Vandenberg AFB in California are reasonable.

Both rulings implement the Commission's July 23 labor policy statement, which contained the guidelines the Commission said it would use in reviewing the reasonableness of any particular labor cost situation referred to it by the contracting agencies.

Industry Gets SOS

Official cites the need for local cooperation

H. E. Lore, president of the National Constructors Association, has warned that the unionized segment of the construction industry, employing AFL-CIO building tradesmen, faces a grave and uncertain future unless local unions and local contractors take prompt and effective action to help curb the progress of its "formidable opponents."

Speaking earlier this month at the 28th general convention of the plumbers international union in Kansas City, Mo., Mr. Lore said the time has come "to scare hell out of the local Building Trades Councils and the local union membership." "You must make them realize," he urged, "that they and we are fighting for our lives."

Mr. Lore said several things are playing into the hands of such competitors as nonunion and District 50 contractors, and are making it easier for in-plant industrial workers to invade the construction field. He cited failure to apply the "rule of reason" in seeking higher wages or profits and failure of unions to accept the responsibility of giving more when they get more; featherbedding; jurisdictional strikes; and unorthodox and costly compromises of jurisdictional disputes.

"Without holding NCA members blameless," Mr. Lore said, "I must place the responsibility where it most often belongs—on the local contractors and the local unions" who are "too damned selfish and nearsighted to see the ultimate effect of their current practices on their and the whole industry's future status."

Mr. Lore suggested that the solution lies not in "more contracts or pronouncements" and not in further appeals to top labor leaders, such as the "Meany's and the Haggerty's" who already know what the situation is. It lies, instead, he said, in "responsible leadership" at the local level and in full use of the "good and workable" labor relations agreements that now exist.

Mentioning the National Joint Board for the Settlement of Jurisdictional Disputes, the "Ten Commandments" work practices code and the NCA's National Disputes Adjustment Plan, among others, Mr. Lore said:

"A simple reaffirmation, and the recognition and the use of these existing agreements will take care of most any situation. One person and one union can't make these agreements work in an interrelated, complex industry such as construction. It takes responsible group action from top to bottom."

OFFICIAL PROPOSALS

Bids: September 21, 1961

New York State Dept. of Public Works Contracts U. S. 75 & 76

NOTICE TO BIDDERS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Barge Canal Improvement Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., September 21, 1961 by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract U. S. 75 for Lowering Sills and Aprons, Raising Towers, Electrical Work and Misc. Work at the East Rome Guard Gates, Rome, Oneida County, New York

and

Contract U. S. 76 for Lowering Sills and Aprons, Raising Towers, Electrical Work and Misc. Work at the West Rome Guard Gates, Rome, Oneida County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Mr. William Mende, Principal Building Engineer, Department of Public Works, 270 Broadway, New York City, New York.
(c) District Engineer, N.Y.S. Dept. of Public Works, 109 No. Genesee St., Utica, New York.

The deposit for Plans and Proposal Forms for each of these contracts is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimates of Cost for Contracts U. S. 75 and U. S. 76 are confidential and will be made known after all bids have been opened.

Proposals for Contract U. S. 75 and Contract U. S. 76 must be submitted in a separate sealed envelope for each contract with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by a certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding checks, the execution of the contracts and bond shall conform to the provisions of the Barge Canal Improvement Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: October 5, 1961

Sewerage System Project Upper Southampton Sewer Authority, Upper Southampton Township, Bucks County Penna.

Sealed proposals for separate Contracts stated below will be received by the UPPER SOUTHAMPTON SEWER AUTHORITY, (Attention: Charles P. Maio, Chairman), at the Shelmire Elementary School, Pennsylvania Avenue and Street Road, Southampton, Penna., until 7:00 P.M., E.D.S.T., Thursday, Oct. 5, 1961, at which place and time, or immediately thereafter they will be publicly opened and read.

Proposals will be for furnishing all necessary labor, materials, and equipment, and performing all work of the separate Contracts. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten (10) percent of the bid total, all in accordance with the Contract Documents.

Copies of the Contract Documents may be seen at and obtained from the main office of Gannett Fleming Corddry and Carpenter, Inc., Engineers, 600 North Second Street, Harrisburg, Pa., and all requests for Contract Documents must be directed to that address, together with the deposit of the following indicated amounts per set. Checks for deposits shall be made payable to Gannett Fleming Corddry and Carpenter, Inc. Not more than two (2) sets of any particular Contract will be permitted a prospective bidder.

Contract One: CONSTRUCTION OF A SEWERAGE SYSTEM $70.00

NOTE: Contract One is divided into three parts; Part A, Part B, and Part C, as shown on the Drawings and described in the Specifications.

(Bidders will be permitted to submit bids for Part A, Part B, or Part C as separate contracts, and also for any combination of Part A, Part B, and Part C as a combined contract; however it will be mandatory for all bidders submitting a bid for any combination of Part A, Part B, or Part C as a combined contract, to also submit bids for Part A, Part B, or Part C as separate contracts (whichever parts are included in the combination submitted). The right is reserved to award separate contracts for Part A, Part B, and Part C, or for a combined contract consisting of any combination of Part A, Part B or Part C, whichever may appear to be in the best interest of UPPER SOUTHAMPTON SEWER AUTHORITY.)

Contract Two: GENERAL CONSTRUCTION OF A PUMPING STATION $25.00

Contract Three: ELECTRICAL WORK FOR A PUMPING STATION....$25.00

Copies of the Contract Documents may also be seen (but not obtained) at branch offices of Gannett Fleming Corddry and Carpenter, Inc. located at 12 East Montgomery Ave., Ardmore, Pa. and 5823 Penn Ave., Pittsburgh, Pa.

Full refund will be made only to actual bidders on the Contracts stated above, for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after bid opening. Refund for return of all other sets within the same period, whether taken out by bidders or non-bidders, will be fifty (50) per cent of deposit. No refund will be made for Contract Documents returned later than fifteen (15) calendar days after bid opening.

The UPPER SOUTHAMPTON SEWER AUTHORITY reserves the right to reject any or all Proposals.

No Proposal may be withdrawn for a period of sixty (60) days after the date and time designated herein for the opening thereof.

Completion times for the work covered by the Contracts from the date of the Notice to Proceed are as follows:

Contract One—Parts A, B and C—each five hundred and forty (540) calendar days.

Contracts Two and Three—each three hundred and sixty (360) calendar days.

UPPER SOUTHAMPTON SEWER AUTHORITY
Gannett Fleming Corddry and Carpenter, Inc., Engineers

Bids: September 12, 1961

Directorate of Highways Ministry of Communications and Public Works Republic of Honduras

ADVERTISEMENT FOR BIDS
FOR
HIGHWAY AND BRIDGES

Western Highway Extension—El Salvador Border to Santa Rosa de Copán Section 1 (Contract No. 61-2-P) and Section 3 (Contract No. 61-1-P)

Sealed proposals for the above noted contracts will be received by the Director General at the Office of the Ministry of Communications and Public Works, Tegucigalpa, D. C., Honduras, C. A., until 10:00 A.M., Honduras time, on September 12, 1961, and then publicly opened.

Prospective bidders can obtain copies of the plans, specifications and contract documents from the Office of the Director General of Highways, Tegucigalpa, D. C., Honduras, for a fee of L 100.00 for Section 1, and L 200.00 for Section 3. A Contractor's financial Statement and Experience Questionnaire and a Plan and Equipment Questionnaire on forms supplied by the Directorate of Highways will be required of all bidders. All proposals must be on the forms prescribed by the Directorate of Highways and must comply with the terms and conditions set forth in the Contract Documents.

Each proposal must be accompanied by a Proposal Guaranty in the amount of ten (10) percent of the total amount shown in the Proposal Form Unit Price Schedule in the form and manner specified in the Instruction to Bidders.

Individuals or firms doing business under fictitious names and all foreign corporations shall register with the Ministry of Communications and Public Works, Tegucigalpa, D. C., Honduras, C. A., before any proposal submitted by such corporations, individuals or firms will be considered.

Award of the above contracts, if any award be made, will be to the lowest responsible bidder or bidders. The Government reserves the right to reject any and all proposals and further reserves the right to waive any informality in proposals received when such rejection or waiver is in the best interest of the Government.

The Government of Honduras has entered into a Loan Agreement with the International Development Association for a Loan in various currencies to finance the foreign exchange costs and part of the costs in local currency of a Highway Construction Project of which these contracts will form a part. Also, the Interamerican Development Bank has granted the Government a loan for the same purposes.

DIRECTOR GENERAL OF HIGHWAYS
Ing. Jorge Begrán Fiallos
July 1, 1961

Bids: September 15, 1961

Flushing, New York

New York World's Fair—1964-65 Corp. will receive sealed bids for the construction of the first phase of the electrical distribution system, cables and substations for the complete installation of two 5,000 KVA transformers and associated switchgear units (mainly furnished by others), furnishing and installation of cables for 27 KV feeders, and for 4.15 KV feeders, in all over 500,000 feet of high-tension cable. Also complete installation of seven additional 5,000 KVA transformers and associated switchgear units to be furnished by others.

Plans, specifications and bid forms for the work obtained from consulting engineer, Syska and Hennessy Inc., 144 East 39th Street, New York 16, New York. A deposit of $100 required for initial prints.

Sealed bids returnable on September 15, 1961 at 10:00 A.M. at the Office of the Chief Engineer in the Administration Building, Flushing Meadow Park, Flushing 52, New York.

U. S. Government

General Services Administration, Public Buildings Service, August 20, 1961. On or about August 24, 1961, bidding material for Remodeling and Extension, U. S. Soil and Nutritional Laboratory, Department of Agriculture, Ithaca, New York, will be available for distribution to general contractors. Applications from general contractors for not to exceed two sets of drawings and specifications should be filed promptly with the issuing office and the bidding material will be forwarded as soon as available. Bids will be opened on September 21, 1961. Description: Alterations to the existing Laboratory Building, and addition of a 4-story wing having a total gross floor area of approximately 17,700 square feet. Concrete foundations, columns, beams and slabs; steel roof framing beams, precast concrete roof plank, insulation, composition roofing; metal stairs, brick (cavity) walls with stone trim, c.m.u. partitions; ceramic, quarry and vinyl tile floors. Wood and metal doors and frames, wood double-hung windows; structural facing tile, ceramic tile, exposed c.m.u. and plaster walls; acoustic tile and plaster ceilings, laboratory equipment, calking, glazing, and painting. Mechanical and electrical utilities; refrigeration, heating and ventilating apparatus. Bidding material will be available at Public Buildings Service, GSA, Region 2, Business Service Center, 250 Hudson Street, New York 13, New York. Commissioner of Public Buildings, General Services Administration.

Sealed bids from Small Business Concerns for extension and remodeling at the U. S. Post Office, Sayre, Pennsylvania, will be received until 2:00 P.M. E.D.T. September 22, 1961, and then publicly opened. Bidding material may be obtained after 8-25-61 from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., from the custodian of the Building where the work is to be done, or from the Chief, Philadelphia Field Office, D & C Div., PBS., Rm. 902 U. S. Custom House & Appraisers Stores, 2nd and Chestnut Streets, Philadelphia 6, Pa.

Read the Official Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

OFFICIAL PROPOSALS

Bids: See Advertisement

North Section
Twelve Towns Relief Drains
Oakland County, Michigan
Contracts NS-1 Through NS-7

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Supervisor's Meeting Room, 4th Floor, Oakland County Office Building, 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

Proposals will be received for the several Contracts up to 2:00 o'clock P.M., E.S.T., on the dates set forth herein.

PROPOSALS TO BE RECEIVED SEPTEMBER 19, 1961

CONTRACT NS-2

3564 lin. ft.	13'-0" Special Horseshoe—Open Cut
4852 lin. ft.	13'-0" Round—Tunnel
1621 lin. ft.	11'-0" Round—Open Cut
55 lin. ft.	11'-0" Round—Tunnel
16 lin. ft.	8'-0" Round—Open Cut

CONTRACT NS-5

948 lin. ft.	7'-6" Round—Open Cut
2030 lin. ft.	7'-0" Round—Open Cut
890 lin. ft.	6'-6" Round—Open Cut
1443 lin. ft.	6'-0" Round—Open Cut
491 lin. ft.	60" Round—Open Cut
613 lin. ft.	42" Round—Open Cut
1458 lin. ft.	36" Round—Open Cut

CONTRACT NS-6

1987 lin. ft.	8'-0" Round—Open Cut or Tunnel
3855 lin. ft.	8'-0" Round—Open Cut
80 lin. ft.	8'-0" Round—Tunnel
2881 lin. ft.	7'-0" Round—Open Cut
1008 lin. ft.	6'-6" Round—Open Cut
2484 lin. ft.	6'-0" Round—Open Cut
70 lin. ft.	6'-0" Round—Tunnel
1382 lin. ft.	5'-6" Round—Open Cut

PROPOSALS TO BE RECEIVED SEPTEMBER 22, 1961

CONTRACT NS-4

2089 lin. ft.	12'-0" Round—Open Cut or Tunnel
3135 lin. ft.	11'-0" Round—Open Cut or Tunnel
150 lin. ft.	10'-6" Round—Tunnel

PROPOSALS TO BE RECEIVED SEPTEMBER 26, 1961

CONTRACT NS-3

4142 lin. ft.	7'-6" Round—Tunnel
2128 lin. ft.	7'-6" Round—Open Cut
1156 lin. ft.	7'-0" Round—Open Cut
140 lin. ft.	7'-0" Round—Tunnel
2227 lin. ft.	6'-0" Round—Open Cut or Tunnel
362 lin. ft.	6'-0" Round—Open Cut
1864 lin. ft.	5'-6" Round—Open Cut
1725 lin. ft.	60" Round—Open Cut
309 lin. ft.	60" Round—Tunnel
2295 lin. ft.	54" Round—Open Cut
75 lin. ft.	48" Round—Tunnel
672 lin. ft.	48" Round—Open Cut
75 lin. ft.	42" Round—Tunnel

CONTRACT NS-7

4238 lin. ft.	9'-0" Round—Tunnel

PROPOSALS TO BE RECEIVED SEPTEMBER 29, 1961

CONTRACT NS-1

5189 lin. ft.	15'-0" Special Horseshoe—Open Cut
5155 lin. ft.	10'-0" Special Horseshoe—Open Cut
111 lin. ft.	9'-0" Round—Tunnel
1036 lin. ft.	9'-0" Round—Open Cut
608 lin. ft.	8'-0" Round—Open Cut
745 lin. ft.	6'-0" Round—Open Cut
2003 lin. ft.	5'-6" Round—Open Cut
547 lin. ft.	60" Round—Open Cut
833 lin. ft.	54" Round—Open Cut
482 lin. ft.	42" Round—Open Cut

together with junction chambers, manholes, straight through structures, angle structures, drop structures, connections and other appurtenances.

All Bidders shall have prequalification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid, and shall submit evidence with his bid of this prequalification rating.

The drawings and specifications under which the work will be done are on file and may be examined at the office of the Board, 317 E. Eleven Mile Road, Royal Oak, Michigan, at the office of the Oakland County Drain Commission, 550 S. Telegraph Road, Pontiac, Michigan, and at the Detroit offices of Builders and Traders and Dodge Reports. Copies thereof may be obtained from the office of McNamee, Porter and Seeley, Consulting Engineers, Ann Arbor, Michigan, by making a deposit of $25.00 (checks only), for each set of contract documents divisions of the work to be bid each day on and one set of plans covering a division or which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents, $10.00 will be refunded for each set returned in good condition within 10 days after the bidding.

OFFICIAL PROPOSALS

A certified check or bidder's bond for a sum not less than five per cent (5%) of the amount of the proposal will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal and to waive irregularities in proposals.

Bids shall be firm for 30 days after the respective dates of opening, within which period of time the Drainage Board shall award contracts. Each Contract shall contain the following provision:

"This Contract is executed and delivered subject to the sale and delivery of the necessary bonds to complete the Twelve Towns Relief Drains. If such sale and delivery shall not be effected prior to March 1, 1962, then either party may terminate this Contract without liability."

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

Bids: See Advertisement

Middle Section and Outlet Structure
Twelve Towns Relief Drains
Oakland County, Michigan
Divisions MS-1 Through MS-6, and OS-1

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Supervisor's Room, Fourth Floor, Oakland County Office Building No. 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

Proposals will be received for the several Divisions up to 2:00 o'clock P.M., E.S.T., on the dates set forth herein, at which time all bids will be publicly opened and read.

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 19, 1961:

DIVISION MS-1

9,654 lin. ft.	13'-3" Tunnel Drain
200 lin. ft.	11'-0" Railroad Section Tunnel Drain
1 each	Regulator Chamber
3 each	Junction Boxes
8 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

DIVISION MS-2

3,369 lin. ft.	11'-0" Tunnel Drain
4,630 lin. ft.	9'-0" Tunnel Drain
1,993 lin. ft.	7'-6" Tunnel Drain
2 each	Junction Boxes
8 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

DIVISION MS-5

1,690 lin. ft.	9'-0" Open Cut Drain
2,130 lin. ft.	8'-6" Open Cut Drain
1,253 lin. ft.	8'-0" Open Cut Drain
2,710 lin. ft.	6'-0" Open Cut Drain
1 each	Junction Box
15 each	Manholes

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:

DIVISION MS-3

11,726 lin. ft.	9'-6" Tunnel Drain
1 each	Junction Box
9 each	Manholes

DIVISION OS-1

1 each	Outlet Structure at Red Run

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:

DIVISION MS-4

1,990 lin. ft.	7'-0" Tunnel Drain
821 lin. ft.	5'-6" Tunnel Drain
767 lin. ft.	5'-0" Tunnel Drain
1,680 lin. ft.	42" Tunnel Drain
883 lin. ft.	7'-6" Open Cut Drain
3,170 lin. ft.	7'-0" Open Cut Drain
850 lin. ft.	4'-0" Open Cut Drain
1,150 lin. ft.	42" Open Cut Drain
912 lin. ft.	36" Open Cut Drain
1 each	Junction Box
22 each	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:

DIVISION MS-6

1,215 lin. ft.	7'-0" Open Cut Drain
1,832 lin. ft.	6'-6" Open Cut Drain
1,697 lin. ft.	6'-0" Open Cut Drain
1,539 lin. ft.	5'-6" Open Cut Drain
950 lin. ft.	5'-0" Open Cut Drain
1,679 lin. ft.	4'-6" Open Cut Drain
496 lin. ft.	4'-0" Open Cut Drain
1 each	Junction Box
18 each	Manholes

All Bidders shall have pre-qualification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid, and shall submit evidence with their bids of this prequalification rating.

OFFICIAL PROPOSALS

The drawings and specifications under which the work will be done are on file and may be examined at the Office of the Board at 317 East First Street (11 Mile Road), Royal Oak, Michigan; at the Office of the Oakland County Drain Commissioner at 550 South Telegraph Road, Pontiac, Michigan; and at the Detroit Offices of Builder's and Traders, and Dodge Reports. Copies thereof may be obtained from the Office of Hubbell, Roth & Clark, Inc., Consulting Engineers, 954 North Hunter Boulevard, Birmingham, Michigan, by making a deposit of Twenty-Five Dollars ($25.00) (CHECK ONLY), for each set of contract documents and set of plans covering a Division or Divisions of the work for each day on which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents, Ten Dollars ($10.00) will be refunded for each set returned in good condition within Ten (10) days after the bidding date.

A certified check or bidder's bond, for a sum not less than Five Per cent (5%) of the amount of the proposal, will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal, and to waive irregularities in proposals.

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

Bids: See Advertisement

South Section
Twelve Towns Relief Drains
Oakland County, Michigan
Contract SS-1 Through SS-8

Sealed proposals will be received by the DRAINAGE BOARD FOR THE TWELVE TOWNS RELIEF DRAINS, Oakland County, Michigan, at the Board of Supervisor's Room, 4th Floor, Court House Office Building, No. 1 Lafayette Street, Pontiac, Michigan, for the construction of certain drains and structures, including the following approximate quantities.

A portion of this project is on the Interstate System under the Federal Aid Highway Act of 1956. As defined under Section 115, the Davis-Bacon Act is applicable and requires the Secretary of Labor to determine the minimum wage rates to be paid by the contractor and sub-contractors, which rates will be given in detail in the proposal.

All Bidders shall have prequalification rating by the Michigan State Highway Department for the appropriate dollar volume and classification of work bid and shall submit evidence with their bids of this prequalification rating.

Proposals will be received for the several contracts up to 2:00 o'clock P.M. E.S.T. on the dates set forth herein.

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 19, 1961:

CONTRACT SS-1

3,330	lin. ft. Reinforced Concrete Triple Box Drain (Each box 14'3"x13'3")
2,150	lin. ft. Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
192	lin. ft. 5'6" Sanitary Interceptor relocation.
1	Junction Chamber
11	Manholes
11,400	sq. yds. Bituminous Concrete Surfacing

CONTRACT SS-4

10,608	lin. ft. 10'6" Tunnel Drain
2,679	lin. ft. 9'6" Tunnel Drain
1,152	lin. ft. 7'0" Tunnel Drain
674	lin. ft. 2'0" Open Cut Drain
3	Junction Chambers
16	Manholes

PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 22, 1961:

CONTRACT SS-2

5,674	lin. ft Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
2,268	lin. ft. 6'0" Open Cut Drain
2	Junction Chambers
12	Manholes

CONTRACT SS-6

2,576	lin. ft. 12'0" Tunnel Drain
2,023	lin. ft. 10'0" Tunnel Drain
2,997	lin. ft. 9'6" Tunnel Drain
8,450	lin. ft. 8'6" Tunnel Drain
635	lin. ft. 4'0" Tunnel Drain
721	lin. ft. 4'0" Open Cut Drain
2	Junction Chambers
24	Manholes

(Continued on the following page)

OFFICIAL PROPOSALS
(Continued from preceding page)

PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:
CONTRACT SS-3
3,608 lin. ft. Reinforced Concrete Double Box Drain (Each box 14'3"x13'3")
1,694 lin. ft. Reinforced Concrete Single Box Drain, 15'6"x13'3"
2,611 lin. ft. 7'0" Tunnel Drain
630 lin. ft. 3'0" Equivalent Tunnel Drain
760 lin. ft.10'6" Open Cut Drain
532 lin. ft. 11'6" Open Cut Drain
1,030 lin. ft. 4'6" Open Cut Drain
1 Regulating Chamber
4 Junction Chambers
22 Manholes
PROPOSALS TO BE RECEIVED TUESDAY, SEPTEMBER 26, 1961:
CONTRACT SS-5
2,298 lin. ft. 9'0" Tunnel Drain
176 lin. ft. 7'6" Tunnel Drain
1,097 lin. ft. 5'6" Tunnel Drain
1,352 lin. ft. 4'6" Tunnel Drain
577 lin. ft. 9'6" Open Cut Drain
1,100 lin. ft. 8'6" Open Cut Drain
2,485 lin. ft. 7'6" Open Cut Drain
1,501 lin. ft. 6'6" Open Cut Drain
838 lin. ft. 6'0" Open Cut Drain
891 lin. ft. 5'6" Open Cut Drain
1,907 lin. ft. 5'0" Open Cut Drain
4 Junction Chambers
27 Manholes
PROPOSALS TO BE RECEIVED FRIDAY, SEPTEMBER 29, 1961:
CONTRACT SS-7
538 lin. ft. 8'6" Open Cut Drain
1,473 lin. ft. 8'0" Open Cut Drain
2,668 lin. ft. 7'6" Open Cut Drain
1,000 lin. ft. 7'0" Open Cut Drain
874 lin. ft. 6'6" Open Cut Drain
2 Junction Chambers
10 Manholes
CONTRACT SS-8
2,268 lin. ft. 11'6" Tunnel Drain
1,862 lin. ft. 9'0" Tunnel Drain
2,325 lin. ft. 9'6" Open Cut Drain
1,812 lin. ft. 7'0" Open Cut Drain
1,097 lin. ft. 6'0" Open Cut Drain
2,595 lin. ft. 4'6" Open Cut Drain
168 lin. ft. 5'0" Open Cut Drain
599 lin. ft. 8'0" Open Cut Drain
514 lin. ft. 2'6" Open Cut Drain
2 Junction Chambers
14 Manholes

The drawings and specifications under which the work will be done are on file and may be examined at the office of the Board at 317 E. 11 Mile Road, Royal Oak; at the Office of the Oakland County Drain Commissioner at 550 South Telegraph Road, Pontiac; and at the Detroit Offices of Builders' and Traders' and Dodge Reports. Copies thereof may be obtained from the office of Pate and Hirn, Inc., Consulting Engineers, 532 Michigan Building, Detroit 26, Michigan, by making a deposit of Twenty Five Dollars ($25.00), (Check only), for each set of contract documents and set of plans covering a Contract or Contracts of the work for each day on which proposals are to be received. The full amount of the deposit will be refunded to the bidder for one set of documents and plans upon which a bona fide proposal has been submitted. For other sets of documents Ten Dollars ($10.00) will be refunded for each set returned in good condition within ten (10) days after the bidding date.

A certified check or bidder's bond for a sum not less than five per cent (5%) of the amount of the proposal will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal and to waive irregularities in proposals.

Bids shall be firm for 30 days after the respective dates of opening, within which period of time the Drainage Board shall award contracts. Each contract shall contain the following provision:

This contract is executed and delivered subject to the sale and delivery of the necessary bonds to complete the Twelve Towns Relief Drains. If such sale and delivery shall not be affected prior to March 1, 1961, then either party may terminate this contract without liability.

DANIEL W. BARRY, CHAIRMAN
DRAINAGE BOARD FOR THE
TWELVE TOWNS RELIEF DRAINS
OAKLAND COUNTY, MICHIGAN

U. S. Government

Sealed bids from Small Business Concerns for new border station at the U. S. Border Station, Massena, N. Y. Project No. 30321, will be received until 2:00 P.M. E.D.T. October 4, 1961; and then publicly opened. Bidding material may be obtained after 9-6-61 from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., or from the Custodian of the Building where the work is to be done.

OFFICIAL PROPOSALS

Bids: October 2, 1961

Bridge and Causeway
San Carlos Bay

Sealed proposals, invited by Lee County, Florida, will be received by the Board of County Commissioners at the regular meeting place of the Board in the County Court House, Fort Myers, Florida, until 10:00 A.M. Eastern Standard Time, October 2, 1961, at which time they will be publicly read aloud, for the construction of approximately three miles of bridge and causeway across San Carlos Bay, connecting Punta Rassa with Sanibel Island. The work includes dredged fill for roadway embankment, bituminous paving, concrete trestle, double leaf bascule lift bridge and other incidental construction as shown in the Contract Documents, copies of which may be obtained from Caribbean Engineers and R. H. Matts & Associates, Architect, 1520 Jackson Street, Fort Myers, Florida, Telephone ED 7-3351. A deposit of Seventy-five ($75.00) dollars (checks only) will be required for each set of contract documents and plans. A refund of Fifty ($50.00) dollars will be made for one set of contract documents and plans to the unsuccessful bidders upon return of same in good condition within thirty (30) days after award of the contract or rejection of the proposal. For other sets of documents and plans, Twenty-five ($25.00) dollars will be refunded for each set returned in good condition within thirty (30) days after date of bid opening.

Bidders must enclose with their proposals, in a separate sealed envelope, complete information as to experience, equipment and financial conduition. Failure to submit this statement will constitute basis for rejection of the proposal.

Each proposal must be submitted on the proposal forms included in the Contract Documents and must be accompanied by a certified check, cashier's check, treasurer's check, or bank draft of a solvent National or State Bank, made payable to Lee County, Florida, in an amount of not less than five percent of the total bid, or a bid bond of like amount on the form set forth in the Contract Documents, as assurance that the bid is made in good faith.

Each proposal or bid shall be submitted in a sealed envelope addressed and plainly marked in accordance with Instructions to Bidders.

No bid may be withdrawn after the time set for opening of bids. The County reserves the right to reject any or all bids and/or to accept the bid which in its judgment is to the best interest of the County of Lee.

Chairman, Board of County
Commissioners, Lee County, Florida

Bids: September 25, 1961

City of Rochester
The Trunk Sewer Improvement

NOTICE IS HEREBY GIVEN that sealed proposals for "The Trunk Sewer Improvement", Federal Project WPC N.Y. 89 and New York State Serial number 3675, will be received by the City of Rochester Purchasing Agent at his office, Room 36, City Hall, No. 20 South Fitzhugh Street, Rochester 14, New York, until 11:00 A.M. Daylight Saving Time on September 25, 1961, at which place and time they will be publicly opened and read aloud. The proposals shall be for furnishing all material, equipment and labor for the construction and erection of structures and appurtenances, in accordance with the Plans, Specifications and other Contract Documents, prepared by Nussbaumer, Clarke & Velzy, Consulting Engineers for the City of Rochester.

The work is to be bid in four separate construction contracts in accordance with the various classifications as follows:

Division A.	Overflow Chambers; Regulators; Manholes; Hastings Street and Cliff Street Screen Chambers; The Hastings Street Siphon; and the Norton Street Outfall.
Division B.	Ventilation
Division C.	Electrical Equipment and Work
Division D.	Plumbing

Bidders may submit proposals for one or more of the four divisions for which they are qualified to bid by law.

These Plans, Specifications and other Contract Documents may be examined at the office of Nussbaumer, Clarke & Velzy, 327 Franklin Street, Buffalo 2, New York, and 500 Fifth Avenue, New York 36, N. Y., and may be examined and copies thereof may be obtained at the office of the Purchasing Agent. One copy of the said documents may be obtained upon payment of $100.00 deposit; any bidder returning such copy in good condition within thirty (30) days following the opening of proposals will be refunded $100.00 and any non-bidder so returning such copy will be refunded $50.00.

The City of Rochester reserves the right to reject any or all proposals, and to waive any informalities, and to make an award to other than the low bidder, should the best interest of the City thereby be promoted.

Proposals shall be made on the form provided in the Contract Documents, and each proposal shall be accompanied by a certified check made payable to the City of Rochester, N. Y., in an amount not less than five percent (5%) of the total amount of the proposal, conditioned that the bidder will execute the Contract and deliver the required Performance Bond for the proposed work within ten (10) calendar days after the date of written notice that his proposal has been accepted. For Proposals with total amounts in excess of $200,000, or proposals for work financed or aided by any Federal or State Agency, a bid bond in the amount of five (5) per cent of the amount of the proposal, in proper form, executed by a surety company acceptable to the City will be accepted in lieu of the aforesaid certified check.

A bidder may not withdraw his proposal within forty-five (45) calendar days after the opening of proposals, but may withdraw his proposal at any time prior to the scheduled time for the opening of proposals.

Information concerning materials and equipment, when requested, must be furnished with bid. Failure to so do will result in bid being declared informal.

Kenneth E. Punnett
Purchasing Agent
City of Rochester, N. Y.

Dated: August 28, 1961

Bids: September 21, 1961

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract GWB-190.050—George Washington Bridge—Lower Level Expansion—Roadway Sealcoat—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, September 21, 1961.

Contract GWB-190.052—George Washington Bridge—Lower Level Roadway—Steel Curb Closures For Upper Level Roadway—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, September 21, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, August 31, 1961

U. S. Government

Sealed bids from Small Business Concerns for extension and modernization at the U. S. Post Office, Massena, N. Y., will be received until 2:00 P.M. E.D.T. October 6, 1961; and then publicly opened. Bidding material may be obtained after 9-8-61 from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., or from the custodian of the building where the work is to be done.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE

The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

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Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

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ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245, Engineering News-Record.

Sanitary Engineer. Opportunity to assume overall supervision and client contact on sanitary projects for long-established midwestern consulting engineering firm. Experience in all phases of sanitary work is desired. Send complete resume of experience and qualifications. Replies held in strictest confidence. Our employees know of this advertisement. P-7178, Engineering News-Record.

Excellent Opportunity—Wanted young, ambitious, graduate civil engineer with minimum of five years experience in all phases of estimating. Will assist successful young, chief estimator for growing East-West Coast construction company. Submit resume including salary, references and availability to P-7256, Engineering News-Record.

Civil Engineer for Overseas Work with design experience to head civil department. Age thirty to forty preferred. Top salary and living allowance for two year assignment. Send resume and photograph to P-7306, Engineering News-Record.

Engineer, Structural — Permanent position with Consulting Civil Engineering firm in upstate New York. College graduate. Send resume including education, experience, personal qualifications and salary desired. P-7285, Engineering News-Record.

General Superintendent-Project Manager refinery construction project California. Submit experience record. P-7324, Engineering News-Record.

Director of Engineering, Ph. D. degree in the field of E.E. or M.E. preferred. Will consider applicant with Master's degree and considerable experience. Responsible for administration and development of four engineering departments. Salary $11,000 up. Location Middle-South. P-7238, Engineering News-Record.

Professor or Associate Professor of Electrical Engineering to teach courses in Electric Circuits and Energy Conversion. Must have Master's Degree in Electrical Engineering. Salary up to $9000. for nine-month tenure. Location Middle-South. P-7240, Engineering News-Record.

Assistant Professor, Electrical Engineering to teach fundamental courses in Electrical Engineering. Must have Master's degree. Salary up to $7200. for nine-month tenure. Location Middle-South. P-7242, Engineering News-Record.

When Answering
BOX NUMBERS . . .
to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

HIGHWAY BRIDGE DESIGNERS
For work in northern Illinois.
Minimum 5 years experience.
Usual Benefits — Permanent.
Maccabee, Campbell & Assocs.
173 W. Madison St., Chicago 2, Ill.

• POSITIONS VACANT

Graduate Engineer, Estimator and Superintendent for heavy construction-bridge and dam construction. Location Ohio and Pennsylvania. P-7245, Engineering News-Record.

Permanent openings for Resident Engineers experienced in supervision of construction of large steam power plants and/or high-voltage transmission lines. Degree and registration desirable. Excellent opportunity with consulting engineering firm. Please send resume of education and experience to P-7228, Engineering News-Record.

Materials Engineer: concrete, asphalt, aggregates. Commercial laboratory, N. Y. Metropolitan area. P-7223, Engineering News-Record.

Openings for recent Civil Engineer graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial buildings, defense construction, heavy construction, and willing to move. Preferably single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Martin K. Eby Construction Co., Inc., P. O. Box 1679, Wichita, Kansas.

Overseas Managers. Long established U. S. consulting engineering firm is seeking engineering graduates to assume positions as overseas Branch Managers. Positions require administrative and management skills, together with experience in design and construction work. Age should be in range of 35 to 50 years. Excellent opportunity for qualified individuals to grow with expanding overseas operation. Send resumes covering personal background to P-7380, Engineering News-Record.

Sanitary Engineers needed to work in Harrisburg and regional offices of the Pennsylvania Department of Health. Merit System vacancies exist for varying levels, with lowest level starting at $6,090 and highest level at $9,923. Written test scheduled for October 7, 1961, which can be administered at convenient location. Final date for filing is September 15, 1961. For further information or applications, please write Mr. Walter Lyon, Director, Division of Sanitary Engineering, Pa. Dept. of Health, P. O. Box 90, Harrisburg, Pa.

Bridge Superintendent—C.E. Degree and currently or recently engaged in bridge construction. W. E. O'Neill Constr. Co., 2751 Clybourn Ave., Chicago 14, Ill.

Sanitary Engineer with 3 to 10 years experience in preliminary studies and/or design of sanitary projects. Long-established consulting engineering firm offers permanent employment with opportunity for advancement. Please submit resume of education, experience and salary requirements to P-7363, Engineering News-Record.

City of Arcata has openings for: City Engineer, Calif. Regis. C.E., exper. including muni. pub. wks, water and sewer systems, $600-$750, starting salary dependent upon experience. Asst. City Engineer, Grad. Engr., E.I.T., office and field work, pub. wks. exper. preferred, $500-$600. Live and work in the heart of the Redwood Empire College town, modern schools, equable climate. Apply City Mgr., City Hall, Arcata, Calif.

• POSITIONS VACANT

Superintendent of Rigging—Capable of full responsibility for customer contact, estimating, and supervising. Large Middle Atlantic region rigging contractor—domiciled in Philadelphia, Pa. Forward resume of experience, education and background, together with recent photograph. Salary and fringe benefits commensurate with ability and results produced. P-7350, Engineering News-Record.

Sanitary Engineer — experienced Sewage Treatment Plant Design. Permanent position in Connecticut. Send resume, New Haven, P. O. Box 1669.

Sales Executive—To supervise sales and estimating of 8-10 Sales Engineers for light structural steel building fabricator in L.A. area. Volume, 10,000 tons. Salary open. Riverside Steel Construction; 10130 Adella Avenue; South Gate, Calif.

Pakistan—Applications are invited for four positions from Master Mechanics with minimum of 10 years practical experience with reputable construction company using earthmoving equipment, and not less than 5 years practical workshop experience and control of labor. Must be able to read and write English to coach, demonstrate and explain to Pakistani Technicians. Will be required to undertake complete reconditioning of tractors, draglines and all makes of transport. Must understand machinery literature and be able to prepare spare parts requisitions. Will have to act on own initiative and maintain large fleet of heavy equipment of various types. Right man will receive good salary; please state salary and conditions required in application. Selected candidates will be on probation for 6 months after expiry of which the contract will be for 2 years subject to extension. In case the selected candidate does not satisfactorily complete the probationary period, he will be given free passage to the point of hire. Applications should reach General Manager, Machinery Pool Organization, West Pakistan Water and Power Development Authority, Lahore (Pakistan), by the 30th September, 1961.

• EMPLOYMENT SERVICES

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 50 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 659 Brisbane Bldg., Buffalo, N. Y.

• POSITIONS WANTED

General Superintendent-Proj. Mgr. Hvy Const. roads, bridges, bldgs, flood control tunnels, sewage & sewage disp. Concrete mech. background. PO Box 48 Clayton 5 Mo.

Chief Estimator now employed desires connection in South—25 years experience building & heavy construction—best references—available reasonable notice to present employer. PW-7255, Engineering News-Record.

Superintendent of Equipment or Maintenance, 35 with 16 years experience, capable of setting up and supervising the installation of a repair and maintenance program, including cost, records, preventive maintenance and etc. relating to all types of heavy construction equipment. Available in Sept. U. S. or foreign. PW-7365, Engineering News-Record.

(Continued on page 73)

HYDRAULIC ENGINEERS

Mechanical–Reports Specifications

Supervisory Design Engineer

Major design and supervision of design for dams, power plants, canals and other hydraulic works. Must be top man, minimum of ten years experience, capable of directing and producing work.

Hydraulic Design Engineers

Planning, investigations, design of dams, power plants, canals and other hydraulic works. Minimum of five years experience. Several positions available.

Mechanical Engineer

Design of large gates, valves, power plant mechanical equipment and related work on hydraulic projects. Some experience desirable.

Reports and Specifications

Engineer, Civil or Mechanical, for preparation of reports and/or specifications for hydraulic projects. Minimum of five years experience.

All positions are in our Denver office. Salary commensurate with ability and experience including excellent employee benefits. Submit complete resume with references and salary requirements to:

Tipton and Kalmbach, Inc., Engineers
831-14th Street
Denver 2, Colorado

ELECTRICAL ENGINEERS

—for—

TENNESSEE VALLEY AUTHORITY

TVA needs electrical engineers, for its Division of Design and Construction, to work on its expanding program.

FOR DESIGN at Knoxville, Tennessee. Beginning salaries $6600, $7600 and $8950 depending upon qualifications. To work on the design of electrical features of hydro and steam generating plant and other structures.

FOR CONSTRUCTION at various projects in the Tennessee Valley area. Beginning salary $7600 for engineers with 2½ to 3 years experience on heavy construction, preferably steam plants. To do engineering inspection of the installation of electrical features of hydro & steam plants.

All positions carry automatic within grade increases for satisfactory service, liberal vacation and sick leave, retirement, hospitalization and insurance benefits.

Send resume to
EMPLOYMENT BRANCH

TENNESSEE VALLEY AUTHORITY

Knoxville Tennessee

ENGINEERS—DRAFTSMEN

Career positions for highway and bridge design personnel with excellent opportunities for advancement. Salaries based on qualifications and experience. Replies confidential.

Send resume to:

GREEN ASSOCIATES, INC.
Consulting Engineers
220 E. Pleasant St. Baltimore 2, Maryland

REGISTERED LAND SURVEYOR

For work in northern Illinois. Minimum 5 years experience. Usual Benefits—Permanent.

MACCABEE, CAMPBELL & ASSOCS.
173 W. Madison St., Chicago 2, Ill.

IMMEDIATELY AVAILABLE
OVERSEAS TAIWAN

PRESSURE VESSEL WELDING ENGINEER

Mandatory—U. S. Citizenship and Engineering Degree, Minimum 3 years experience in shop and/or field fabrication and assembly of pressure vessels, power and refinery piping, penstocks or large steel pipe lines. Knowledge of manual arc, submerged arc, semi-automatic, automatic and approved processes for Code welding essential, as well as X-Ray interpretation and verification of performance of specification procedures.

High salary plus family accommodations plus living allowance and many privileges in large campsite at Hydroelectric project in Taiwan.

Qualified applicants submitting detailed experience records with past earnings and current references will be interviewed promptly.

Box P-7349, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

RESIDENT ENGINEER

experienced as Engineer's representative in supervision of construction of major bridge. Project includes pile foundations, open-dredged caissons and pier construction, structural steel superstructures and concrete deck.

Only applicants with previous experience in responsible capacities in this field will be considered. Registration will be required. Location South. Submit resume, references, salary requirements and photo to

P-7371, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

PLANNING ENGINEERS

Must have broad background in the planning of river control works, drainage, and highways. Should be familiar with project and regional economic analyses. Fifteen to twenty years experience necessary. Good salary. Fringe benefits. There will be some foreign travel. Please send complete resume of experience to Personnel Manager.

HARZA ENGINEERING COMPANY
400 West Madison Street, Chicago 6, Illinois

MANAGER MACHINERY SALES

Equipment engineer needed for managerial position with firm producing custom built equipment for construction and mining. Experience in or knowledge of fabrication, sales, design. California location. Send photo and resume.

P-7370, Engineering News-Record
255 California St., San Francisco 11, Calif.

ENGINEER DESIGNER

Permanent career opportunity for qualified engineer experienced in design and operation of aggregate plants, central mix concrete plants, and related materials facilities. East coast location with multiplant operator.

P-7360, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

PAPER MILL EXPERIENCE

Designers, detailers—Architectural, Structural, Mechanical, Electrical, also Construction Project Manager. Positions will pay top rates for top-notch men. Two-year project could lead to permanent position. Upstate New York. Send complete resume and salary requirements.

KARL J. BEA associates ENGINEERS
Pulaski, New York

• POSITIONS WANTED
(Continued from page 71)

Purchasing Agent, field office mgr. 20 yrs. job site experience. All types building & heavy const. Cost conscious. PW-7250, Engineering News-Record.

Canadian draftsman 34, 15 years experience Municipal, Topo. Mapping. Desires permanent employment San Francisco area. Requires sponsor. John LeSueur, 1068 Burnaby St., Vancouver 5, B. C., Canada.

Resident Manager-Craft, Field Superintendent. 22 years supervisory and advisory experience industrial type construction domestic, Europe, Middle and Far East. Refinery, steam generating, pulp, atomic energy, nuclear research reactors etc. Capable administrator, personnel, labor relations, contract administration. Strong background piping, instrumentation, mechanical. Complete second Middle East contract. Available overseas only. PW-7309, Engineering News-Record.

General Supt.-Project Manager. 20 years experience heavy construction—expressways, toll roads, airports, dams. Can handle all phases work from preliminary bid investigation through final estimate. PW-7278, Engineering News-Record.

Civil Engineer, registered, BSCE, 30—desire position as City Engineer or Director of Public Works. Presently Engineer in Public Works. Experience in highways, bridges, municipal works, land development and surveys. Resume on request. PW-7339, Engineering News-Record.

34 year old college graduate, 10 years experience as Structural Ironworker, 5 years as Sales Engineer of construction equipment and industrial components desires interesting, challenging position in related field. PW-7315, Engineering News-Record.

Superintendent or Resident, or Asst to same. 15 years top experience in heavy construction. References well known in field. PW-7296, Engineering News-Record.

Engineer, 35, married—family, B.S. and M.S. in C.E., Professional license, ten years experience Field Engineering and supervision with both general building and mechanical contractors, States and Foreign, desire association with small engineering or contracting firm with possibility of part ownership or profit participation. Have capital for investment. Write PW-7292, Engineering News-Record.

Graduate Engr.—Age 33—10 years experience all phases of construction seeks challenging position in construction management with opportunity for advancement and growth. PW-7379, Engineering News-Record.

Geologist Engineering Miner—30, family, willing to relocate. Exp. in design and drafting of highways & bridges, subdivisions including calculating, san. sewer, profiles and water systems. Supervision of bridge, water well drilling and highway construction. PW-7356, Engineering News-Record.

Project Manager—age 32 wants assignment overseas. Wide experience on Supervision and Inspection contracts. PW-7376, Engineering News-Record.

Estimator—Manager, Civil Engineer. 12 yrs. experience in all phases of sewer, water and paving projects. Desires to relocate in East. Salary min. $10,000. PW-7353, Engineering News-Record.

Supt. or General Foreman—age 43—over 18 years experience highway construction supervising earthmoving equipment, excavating, drainage. Know men, methods and cost. Available at once. A-1 references. PW-7368, Engineering News-Record.

Construction Engineer — Civil: Seventeen years broad experience in office and field management, estimation and superintendence in commercial, industrial and housing fields. Desires responsible position with growth contractor in Kansas City or Northwest Mo. areas. PW7388, Engineering News-Record.

Structural Engineer, M.S., P.E., experienced in industrial, power, chemical plants, bridges and heavy foundations, desires responsible position with Engineering or Architectural firm in New York. PW-7364, Engineering News-Record.

• POSITIONS WANTED

Office Manager, experienced in all phases of Field Office work, payroll, taxes, accounts receivable, payable, purchasing 17 years experience. PW-7344, Engineering News-Record.

Civil—Sanitary Engineer, Reg. Prof. Eng., Member A.S.C.E. 15 years diversified experience in Sanitary Engineering. Desire responsible position or association with Mid-West consultant. PW-7351, Engineering News-Record.

Superintendent or Construction Manager. Civil Engineer with 25 years experience in general construction field organizing, scheduling and supervising projects; including estimating, submitting proposals, purchasing and negotiating subcontracts. Will relocate. Salary $175.00/week. PW-7377, Engineering News-Record.

Civil Engineer 5 years overseas and domestic experience in design, layout, and inspection of highways, water works, pumping stations, pipelines, and buildings. Seeks overseas job as field or design engineer. B.S.C.E., single, 28. PW-7369, Engineering News-Record.

B.S.C.E., Age 38. Ambitious, high grade. Desires sales work. Broad responsible experience, chiefly contracting in public & private works, bldgs., bridges, flood control etc. Will relocate including foreign. PW-7367, Engineering News-Record.

Field Clerk, typist, timekeeper, thoroughly experienced in field office procedures. PW-7345, Engineering News-Record.

Struc. Designer—Age 39. B.S.A.E. 13 years experience. Would like field construction opportunity. Prefer Chicago area. PW-7355, Engineering News-Record.

• POSITIONS WANTED

Construction Administration Engineer— B.S.C.E., 52, Reg. P.E. (Ill.) Project Administration—Supervision from contract to completion. 30 years experience heavy construction of subways, superhighways, tunnels, sewage treatment plants, land development and high rise architectural structures. 25 years as resident or administrative engineer in complete charge of construction. Resume submitted upon request. PW-7381, Engineering News-Record.

Construction and/or Sales Engineer—Returning after foreign assignment. Four years for earthmoving equipment organization. BS Engineering, Texas A&M. Bilingual English-Spanish. Resume on request. PW-7385, Engineering News-Record.

Plant or Facilities Engineer, P.E., 14 years design, installation, maintenance. Supervision on multi-million industrial projects. Resume on request. PW-7384, Engineering News-Record.

Administrator, graduate engineer experienced in management, purchasing, estimating, subcontracts, and expediting. large and small building construction. PW-7383, Engineering News-Record.

Preservation Engineer—8 years service with civil defense director of European capital, 5 years U. S. residence; ample structural and consultant experience, graduate C.E., member technical societies. PW-7382, Engineering News-Record.

Secretary—Female, 25, desires position anywhere Latin America. 9 years' experience, 3 years engineering office, all office skills. 2nd year University Spanish course. PW-7394, Engineering News-Record.

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CLASSIFIED ADVERTISING

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$2.70 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

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CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• BUSINESS OPPORTUNITIES

Exclusive Franchise offered to Professional Engineer. Proven money-making home inspection consulting service has received tremendous national publicity. New York Engineering firm founder with offices in Long Island, New Jersey, Chicago and Detroit, again expanding and offering franchises in other metropolitan suburban areas. Professional, graduate engineering background required. Little capital needed. Tell age, education, experience in first letter. Strictest confidence. BO-6348, Engineering News-Record.

Michigan General Contractor needs working partners 25-50 thousand dollar investment, or sell corporation million dollar plus volume. BO-7358, Engineering News-Record.

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—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publishers to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

STRUCTURAL ENGINEERING
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OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.
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Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.
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WANT TO PURCHASE
Construction or Engineering Firm
Entire interest or working control in a large well established construction company or engineering company with a successful record of having completed large-scale projects. We will pay cash for this acquisition and give to present management a profit participating management contract for a period of years. We can furnish excellent bank reference and we are placing this advertisement as principals.
Send three year profit and loss statement and balance sheet, plus business description to
BO-7216, Engineering News-Record
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

10 MACK DUMPS

MODEL LRVSW

24 yard capacity—Cummins 400 HP engines—torque converters—power steering—1600 x 24 tires, front & rear. In excellent condition. Location: 6 in Minn., 4 in Kansas City. Also 2 Euclids—35 ton 4FFD's in very good condition.

ERNIE RIEKE EQUIPMENT COMPANY
3311 Merriam Lane--Kansas City 3, Kan.
Telephone—days, HE 2-1601;
nights, CO 2-7733

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750 KVA GENERATOR

One 750 K.V.A. alternating current generator complete, consisting of the following:

1 Type JS-6-t Cooper-Bessemer Diesel Engine No. 4282, size 13 x 16, RPM 450, H.P. 865, with Buck Supercharger, with water cooling system and oil clarifer.

Generator by Elliott Company #2185, Frame 6112, Design D 342, 750 K.V.A., 8 P.F., 600 Kilowatts, 240 Volts, 3 phase, 60 cycle, 1800 amps per terminal, 450 RPM, Field Current, 60 amps, 125 volts Continuous rating, 50 degrees C Temperature Rise.

Switch Gear by Elliott Company, M.O. #6736, Serial #1108, Voltage 240, Weise 3 K.V.A. 750, 3 phase, 60 cycle.

This unit has been used for stand-by electric power and is in excellent condition. Can be test run and inspected.

THE JACOBSON CORPORATION
P O Box 7594 (Portlock Br.)
Norfolk 15, Va.
Telephone 543-2066

FOR SALE or RENT

Manitowoc 3900-A Lift Crane. New 1959. 130' Bm. 30' jib. Ind. Bm. Hoist & Swing. 48" treads. Dual Controls.

Lorain L50 Crane-Dragline. 1 yd. New 1951. 60' Bm. GM Diesel. Torq Conv. 30" treads. Dual controls.

50 Ton Amer. 3046 Stiffleg Derrick. 130' bm.

30 Ton Wiley Type F Stiffleg Derrick. 60' bm.

20 Ton American Stiffleg Derrick. 96' bm.

200 HP Amer. #180 3D Elec. Hoist & Swinger.

40 ton Amer. #408 Diesel Locomotive Crane.

45 & 25 Ton GE Diesel Elec. Locomotives.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS BRIDGES BREAKWATERS FILTRATION AND SEWERAGE PLANTS

FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

16" x 10" PIERCED PLANK AIRPORT LANDING MATS. Marsten Type-Interlocking. New Surplus—Never used. Original Bundles.

PACO—Seattle, Wash.
P. O. Box 3742A MA. 4-5201

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FOR SALE

a. Four Babcock & Wilcox Marine Type Boilers. 1634 sq. ft. heating surface rated 250#. Two Mayflower burners each unit. Now being removed from former U. S. E. D. Dredge.
b. 1635 H. P. Skinner "Uniflow" 6 cyl. 16" x 16" Vertical steam engine.

FS-7327, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

WANTED

200 H. P. Electric Motor

230 V. D. C. Low speed preferred.

W-7326, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

H & SHEET STEEL PILING

1400 PCS. BP8, BP10, BP12—BP14—55' to 60'
3700 PCS. BETH. SP6A 50', 56' 48' & 40' & 35'
1900 PCS. MP112—12' 15' 20' 25' 31' 35' & 60'
2800 PCS. BETH.—AP3 10, 15', 20', 25', 30' & 60'
2500 PCS. BETH.—DP2—20', 25', 30', 35', 40' & 60'
1200 PCS. ZP38-ZP32—20', 32', 36', 40', 50', 60'
600 PCS. ZP27—20', 26', 31', 40', 45', 60'
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TORONTO—BALTIMORE—JACKSONVILLE
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25 Ton Industrial Loco Crane 60' Boom

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ENR-T4

The Challenge of New Shapes

PROGRESSIVE ARCHITECTS in recent years have evinced strong interest in shapes other than the rectangular and flat. And as they experimented with these new shapes, engineers demonstrated ability to cope with the structural, mechanical and electrical problems posed, and contractors have developed economical construction methods. Thus, experience to date proves that there is nothing to fear in nonrectangular construction if the design is functionally and esthetically sound.

Strongest evidence of the growing interest in new shapes has been the increasing use of three-dimensional surfaces for roofs. The years immediately following World War II saw a substantial rise in barrel-arch construction. Advances in prestressing at about the same time gave added impetus to use of domes. In the Fifties, designers began to specify more and more folded-plate roofs, and in the same period, warped surfaces—especially hyperbolic-paraboloids—became popular among the avant-garde.

The shift from rectangular to curved roofs also affected the shapes of building facades in many cases. Though structures with barrel-arch or folded-plate roofs frequently remained rectangular in plan, domes, conoids and hyperbolic-paraboloids encouraged use of curved facades. Favorable public reception of these shapes encouraged designers to go one step further.

It now appears that the Sixties will be a decade noted for development of nonrectangular interiors. Some such interiors have resulted from the curved plans imposed by unconventional roofs. But the more significant in the last two years are those designs resulting from searches for shapes that permit maximum efficiency in use of space.

Some examples of adaptations of circles and hexagons to produce compact schools were reported in ENR Aug. 24, p. 28. Others that come to mind are Marina City's twin, circular, 60-story apartment towers in Chicago; the Police Administration Building in Philadelphia; and Scott and White Memorial Hospital in Temple, Texas—a clover leaf in plan, with circular rooms.

These examples currently under construction will no doubt encourage architects to continue to search out and call for the most advantageous shapes for interiors, facades and roofs. Engineers and contractors for their part have already shown that they can meet the challenge of such special shapes.

For Shelters: Code Changes

THE RELATIVELY FEW SHELTERS built in the U.S. for fallout or bomb protection have offered little opportunity to test their safety or suitability for living quarters. It is therefore not surprising that some communities have refused construction permits for shelters on the ground that they didn't meet building-code requirements.

The building officials involved have no other choice; their position requires them to enforce the law that requires all construction to meet specific health and safety standards. As the building officials have pointed out, the shelters refused permits did not have adequate light, ventilation, sanitary facilities or safe entrances and exits. Of course, in an emergency the public would be glad to have them. But the emergency may never occur, and meanwhile the shelters would invite some kind of illegal occupancy.

Two solutions to this problem would seem to be available. One is to raise the standards for shelters to meet code requirements, which will substantially hike construction costs. The alternative is to change building codes to permit minimum-facility shelters.

This can be done. But if it is, there should be some guarantee that local officials will inspect all shelters at frequent intervals to prevent occupancy inimical to the public health and safety.

Tunnel or Bridge or Neither

AMIDST THE CONSTANT FLOW OF NEWS about conferences on grave international problems—atomic testing, Bizerte, Berlin and the like—it is a relief to read that such a peaceful subject as the proposed crossing of the English Channel is to be discussed by responsible officials of the British and French governments (see p. 24). It is interesting that they will have proposals for both a bridge and tunnel to consider. But, above all, it is encouraging that officials of the two governments are finally going to meet face to face, with apparent serious intent, instead of talking aimlessly across the Channel.

Private promoters have gone about as far as they can without government help. The Channel Tunnel Study Group, composed of French, British and American interests, has in fact spent nearly some $700,000 on soundly conceived and expertly conducted engineering investigations and economic studies. These have proved to the group's satisfaction that construction of either a tunnel or a bridge is technically feasible; its choice, based on economic considerations is a twin-bore railroad tunnel.

A French group is now said to have completed a definitive study for a highway bridge, which will also be under consideration. The important point is that the British and French government officials will now have available—and for the first time in the century-old history of this Channel crossing dream—a really substantial set of authoritative engineering and economic information. They can by the action they recommend pretty well determine whether a bridge or tunnel or neither will be built across this 25-mile waterway.

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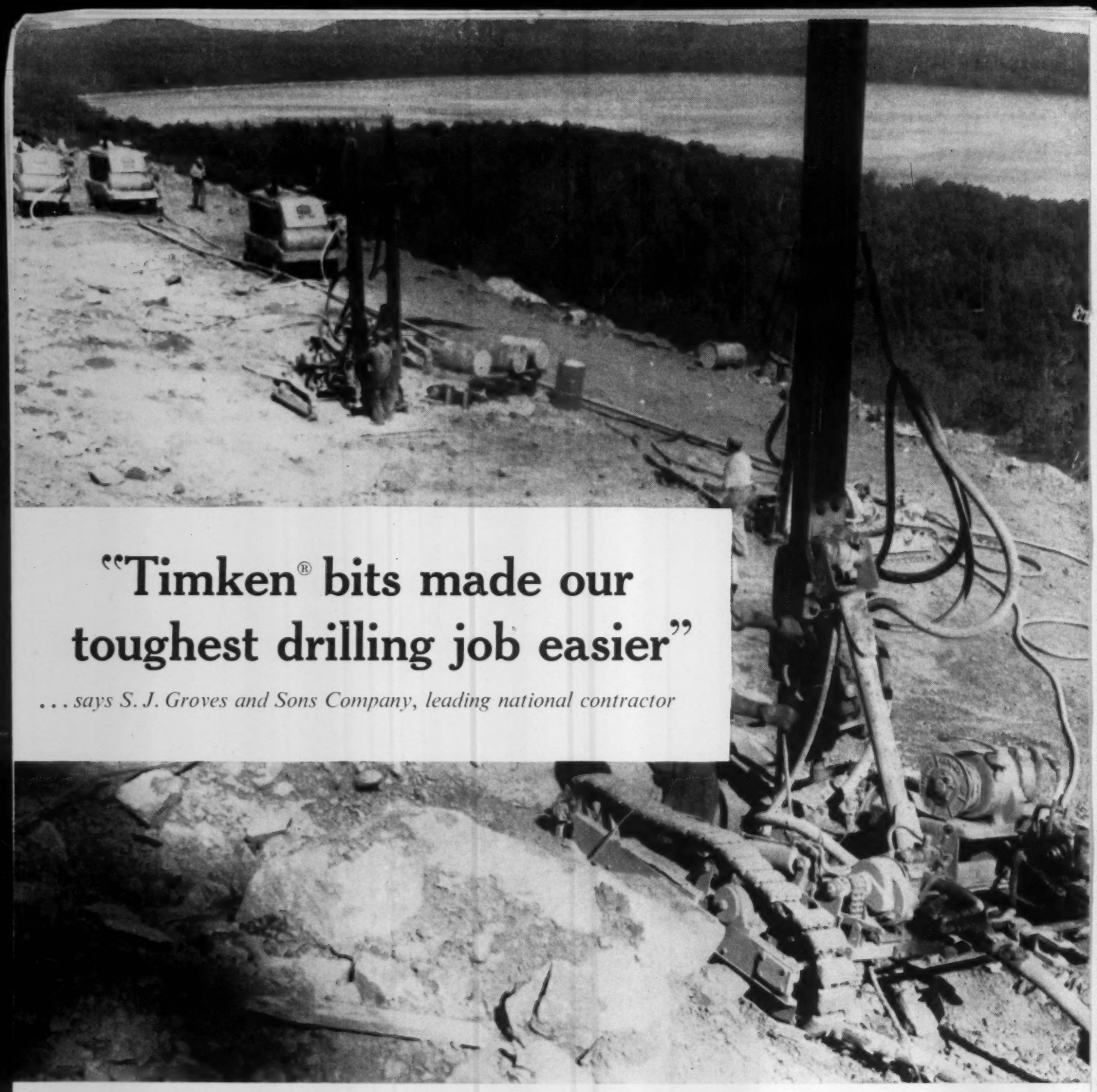

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